

# POPULAR Computing WEEKLY

Only 50p.

21-27 August 1986

Vol 5 No 34

**SPECIAL  
supplement**  
**THE BBC**

## Music 5000 exclusive

Incentive's GAC for the BBC

**News Desk**  
The Spectrum Plus 2 -  
full details

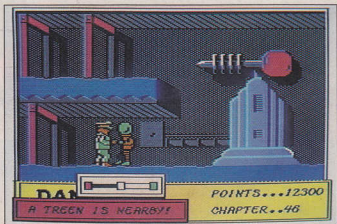
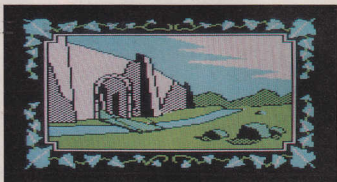
Amstrad PC casts  
doubts on PCW range

**Micro chess**  
Starts this week

## Colour reviews

US Gold smash hit  
Leaderboard - now  
on Atari ST

Dan Dare -  
the computer  
comic strip



# DYNAMITE DAN II

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Find and destroy Blitzen's secret record-pressing plant, hidden deep in the 8-island complex of Arcanum. 200 screens of crafty sprites, foot-tapping music, and totally addictive gameplay!



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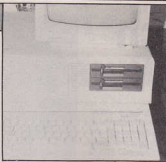
**MIRRORSOFT**

Purnell Book Centre, Paulton, Bristol BS18 5LQ

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Low cost IBM PC compatibles are in the news at the moment, with the launch of Amstrad's model coming up in September. One British company that has beaten Amstrad to it is Spectrum Group, which is importing the cheap Bondwell PC clone. John Lettice assesses its chances in the market.



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SPECIAL  
SUPPLEMENT  
THE BBC

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ABC

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# Late launch for Plus 2?

AMSTRAD'S new Spectrum Plus 2 is to go on sale towards the end of September at £149. As expected the machine will have a full-travel keyboard, built-in tape deck and twin joystick ports, and will be compatible with both the 48K and 128K versions of the Spectrum.

Amstrad, however, appears to have done little or nothing more to enhance the machine. The keyboard layout is the same as those of the Plus and the 128, but most of the keywords used in

the 48K's single-key entry Basic have been removed from the keys, the exceptions being commonly-used ones such as *Load*, *Code* and *Run*. If you're programming in 48K mode you'll, therefore, need a good memory.

Amstrad won't comment on either availability or specification of the machine as yet, but it seems that I/O will be limited to a standard Spectrum expansion bus, and that the non-standard RS232 port which appeared on the 128K Spectrum has been stripped



Ring out the Plus minus?

out of the machine. If this is the case then Amstrad will have avoided the embarrassment of only having an RS232 port fitted as standard on its cheapest machine.

Amstrad is, however, con-

fident that the machine can succeed in the games market, and is mounting a major advertising push for it starting in October, the object being to take it to number one in the Christmas market.

## Mastertronic claims top payout slot

MASTERTRONIC, often accused by rival software houses of giving programmers poor rewards, is claiming to be Britain's top royalty payer. According to company boss Frank Herman the company paid out £468,930 in royalties and £90,000 in advances to British programmers in the year ended June 30 1986, and he challenged other software houses to match these figures.

"The allegation has often been made that Mastertronic takes everything out of the industry and gives nothing back, but these figures answer that," he said. He professed to have no idea how many software titles the royalties were spread over, but said the company's turnover in the period had been £3-3 million.

## Alpha adds five

ALPHA-OMEGA is to launch five new titles at the beginning of September. *Dekorative Blues* and *Death Ball* are for the Spectrum, while *Gods and Heroes* and *Aftermath* are for the Commodore 64 and *TimeLord* for the Amstrad.

All of the titles will retail at £1.99.

# Pandora's Spring launch

SIR Clive Sinclair's Pandora portable computer and WSI (Wafer Scale Integration) project won't now go into production before next Spring.



Clive - funding sought

According to a spokesman for Anamartic, the company Sinclair set up to produce WSI, pre-production samples of the units have now been produced by STC, but full production will depend on further finance (see *Popular Computing Weekly*, July 17). Anamartic proposes to make a finance-related announcement in early September.

Pandora is still being worked on by Sinclair Research, but has been forced back to the drawing board by Amstrad's purchase of the Spectrum. The Pandora was intended to be based on the latter, but Amstrad has expressed no interest in produc-

ing it. The machine is still likely to be Z80-based, but will probably have at least data file compatibility with the IBM PC.

The WSI units are intended to provide cheap mass storage by using large wafers of silicon rather than individually chips wired together. The problem here - which Anamartic claims to have solved - is that conventional Ram can be made up completely of working chips, while the WSI wafers need their own on-board logic to patch out faulty sections. Initially WSI will be purely Ram, and will be vulnerable to conventional hard disc rivals.

## PCW Spell-checker

COMPUTER One has launched a spelling checker of over 60,000 words for the Amstrad PCW micros. According to the company its dictionary is twice the size of that of many programs, but despite this the product loses nothing in terms of speed, checking at 1,500 words a minute.

The program has a help facility, and can break down and rearrange dictionaries into whatever category is required. It has 46 commands, plus 15 wildcard options, and costs £34.95.

Details from Computer One, Cambridge Science Park, Milton Road, Cambridge CB4 4BH. Tel: 0223 862616.

## Pyramide swelling

PYRAMIDE Software is to convert its entire range of QL products including *Nucleon* and *Morteville Manor* to the Atari ST. Prices and release dates should be available in the next few weeks.

Details from Rio Promotions, 28 Waverley Grove, London N3.

## 64 gets printer interface

CITIZEN has launched an interface that will allow owners of Commodore 64, 128 and Vic 20 micros to use the Citizen 120D printer. The 120D plus interface is able to produce the full set of Commodore characters and also allows the Commodore machines to produce output in both draft and letter quality. It comes with a two-year warranty, and costs £52.

Details from Citizen Europe, Wellington House, 4/10 Cowley Road, Uxbridge. Tel: 0895 72621.



# PCW price cuts to follow PC launch?

AMSTRAD'S launch of its IBM compatible micro, planned for next month, is raising questions about the continuing viability of the company's PCW machines at their current price level.

The new PC 1512 is to cost £469 for a 512K system with single 5 $\frac{1}{4}$  inch drive and monochrome monitor, while the entry level PCW, the 8256, costs the same for 256K, single 3 inch drive, monochrome monitor and printer. Amstrad is clearly banking on the PCW's printer being enough to differentiate the products, but retailers are unconvinced.

Mark Horne, managing director of Softshop, plans to stock the PC, but feels that at current price levels it will damage sales of the PCW. "If I was Sugar I'd accept that the PCW would become an entry level machine, and drop the price," Horne doesn't claim to be close to the Great Man's ear, but is confident that the PC will make a breakthrough to the small business market, and will probably be more successful here than the

PCW. But, he says, "if you ask me if I'm stocking up on PCW's the answer's no."

Softshop plans to stock the PC in its "Amstrad Centre" branch in London's Totten-

out to be on the high side.

Meanwhile Tandy, due to launch its 1000EX PC compatible today (August 21, see separate story) is upping the ante in the small business



The PCW: price cuts ahead?

ham Court Road, and is currently planning a range of about 20 software titles for the machine. These will run on other PC lookalikes, but will be cheaper than PC software has been until now - Horne reckons on most of them being around the £100 mark. As Microsoft intends to issue versions of its programs for £50-£100, however, Horne's estimate may turn

was by refusing to stock Amstrad's PC and unceremoniously dumping the PCW. "When we decided to stock the PCW we identified a market area which we did not have a machine for," explained a spokesman. The company now clearly feels it has one in the shape of the 1000EX, and sees little point in giving Amstrad sales it could make itself.

## Tandy stores to get new budget PC

TANDY is to join the low cost PC compatible market with the 1000EX, which costs £528 for a 256K machine with single 5 $\frac{1}{4}$  inch drive and monochrome monitor. The machine has less memory and costs more than the predictions for the Amstrad PC, but has a faster clock speed than the IBM PC (7.16MHz, for which Tandy claims a 50 per cent speed gain) and includes *Personal Deskmate* bundled software.

The latter is a windowing system featuring pull-down menus and including word processor, spreadsheet, electronic filing, notepad, communications and paint applications.

The company is also launching an enhanced version of its Tandy 100 lap portable, the Tandy 102, for £344. The machine has 40 x 8 character LCD display, 24K Ram and built in modem. The modem isn't yet approved for use in the UK.

Tandy has also launched a machine compatible with IBM's AT further up-market, but at its current price the machine isn't likely to threaten the hard disc PC expected from Amstrad.

## Apple set to launch new Iix

APPLE has scheduled the UK launch of the Apple Iix, its follow-up to the Apple II for October 29, when it intends to hold the first UK Apple Expo at the Business Design Centre in Islington, London. Apple won't talk about the new machine, but it's expected to have a 16-bit 65816 processor compatible with the II's 6502, PC compati-

bility, monochrome monitor and twin 3 $\frac{1}{2}$  inch disc drives. It should retail for around £1,000.

Apple is currently running what it describes as a "teaser campaign" aimed at current users of the Apple II. Owners are invited to call Freephone Apple, where an operator takes their name and address and promises more information in the next few weeks.

Apple US is keeping a tight lid on the new product, but Apple UK spokeswoman Sonja Garsvo suggests that it is likely to be a product midway between add-on and new machine. The strategy, therefore, would seem to be to launch the Iix as a new machine, while at the same time providing upgrade facilities for the II and Iie.



Upgrade ahead for the II.



Pet is no dog, says Supersoft.

## New home for unwanted Pets

SUPERSOFT has bought up the stocks of Commodore Pet computers displaced by the closedown of Commodore's Corby factory. The company now has several hundred of the machines along with large numbers of 1361 printers, and proposes to offer the equipment to both end users and dealers.

Supersoft director Peter Calver explained that the Pet still represents a large slice of the company's software turnover. "I think we're the only software house that still regards it as a serious machine." He now intends to continue software and hardware support for it "well into the 1990s".

Details from Supersoft, Winchester House, Wealdstone, Harrow, Middx HA3 7SJ. Tel: 01-861 1166.

## CYRUS II

CYRUS  
0:02:49

PRESS  
(SPACE)  
FOR  
MENU

CYRUS  
0:01:17



## Alligata's Spectrum Cyrus

ALLIGATA is to release a Spectrum version of Intelligent Software's *Cyrus II Chess* program at the PCW Show. The program will cost £11.95 and will feature nine skill levels, a selection of library openings, print out option, hint facility and game analysis. The first version for the 48K machine will be followed by a 128K program featuring 3D display.

Details from Alligata, 1 Orange Street, Sheffield S1 4DW (0742 755796).

## Computing dictionary

COLLINS has produced a pocket dictionary of computing, the *Collins Gem Dictionary of Computing*. It contains over 200 entries accompanied by

100 diagrams and captions, and although obviously not as comprehensive as larger dictionaries has the virtue of being portable. It costs £1.95.

Details from Collins, 8 Grafton Street, London W1X 3LA (01-493 7070).

## Teletext editor for the BBC

WATFORD Electronics has launched TED, a teletext editor for the BBC micros. The system consists of a 32K Rom, manual and function key strip, and can modify frames so that they can be downloaded to Prestel, or can display pages carousel style as either a "show" or a "scroll".

A scroll consists of a 600-line screen with the current display acting as a 25-line window. The show option is used to display a series of teletext screens with the tim-

ings and routings specified by the user. Shows can also be converted to scrolls for easier viewing.

The system is compatible with the BBC B and requires a single Rom socket. Price hasn't been fixed yet, but the product should be available shortly.

Details from Watford Electronics, 250 High Street, Watford WD1 2AN (0923 37774/40588).

## MicroPro gains retail support

MICROPRO'S *Pocket Wordstar* and *Pocket Wordstar Deluxe* are to be sold through high street retailers WH Smith, Boots and Laskys. The packages will be available in 3 inch disc format for the Amstrad 8256, 8512 and 6128 machines. The programs will be sold alongside MicroPro's other *Pocket* products, which include *Calstar*, *Infostar* and *Supersort*.

WH Smith is to include free hotline support for the products in their price.

Details from MicroPro International, 28/31 High Street, Wimbledon Village, London SW19 5BY. Tel: 01-879 1122.

## Modem offer from Tandata

TANDATA is currently running a special offer allowing schools to buy its Tm512 range and Tm602 triple

speed modem at reduced prices. The Tm512TP was the subject of the Department of Trade and Industry's "modems for schools" initiative, and is now available to educational establishments for £159.

Details from Tandata Marketing, Albert Road North, Malvern, Worcs WR14 2TL (06845 68421).

## Video stock control

VIDEOFILE is an Amstrad PCW program designed for video library managers. It can control issue and return of tapes, list tapes and members, and twin drive versions can hold lists of over 9,300 entries. It costs £79.95.

Details from SP Electronics, 48 Linby Road, Hucknall, Nottingham (0602 640377).

## Handbook for communications

THE NATIONAL Computing Centre has issued the third volume in its series of interconnecting applications handbooks. The new handbook, *Links to On-Line Databases and Electronic Mail Systems*, gives details on UK and European hosts and costs £45 plus £2.30 postage and packing.

Details from The National Computing Centre, Oxford Road, Manchester M1 7ED. Tel: 061-228 6333.

## Diary Dates

### SEPTEMBER

3-7 September

#### Personal Computer World Show

Olympia, London  
Details: Software and hardware for home, educational and business computer users.

Price: £2.

Organiser: Montbuild, 01-487 5831.

12-14 September

#### 8th Official Commodore Computer Show

UMIST, Manchester  
Details: A wide range of Commodore hardware, software and peripherals.  
Price: £3 adults, £2 children, £1 discount for advance booking.

Organiser: Database Exhibitions, 061-456 8835.

26-28 September

#### Electron and BBC Micro User Show

UMIST, Manchester  
Details: Software, hardware and peripherals for BBC machines.  
Price: £3 adults, £2 children, £1 discount for advance booking.  
Organiser: Database Exhibitions, 061-456 8835.

### OCTOBER

3-5 October

#### The Amstrad Computer Show

Novotel, London

Details: Home and business software and hardware for the Amstrad range.  
Price: £3 adults, £2 children, £1 discount for advance booking.

Organiser: Database Exhibitions, 061-456 8835.

30-31 October

#### Hampshire Computer Fair

Guildhall, Southampton

Details: Business computers.

Price: Free entry by business registration.

Organiser: Testwood Exhibitions, 0703 31557.

### NOVEMBER

7-9 November

#### Electron and BBC Micro User Show

New Horticultural Hall, Graycoat Street, London SW1

Details: Hardware, software and peripherals for the Electron, BBC micro and Master series.

Prices: £3 adults, £2 children, £1 discount for advance booking.

Organiser: Database Exhibitions, 061-456 8835.

Prices, dates and venues of shows can vary, and you are therefore strongly advised to check with the show organiser before attending. *Popular Computing Weekly* cannot accept responsibility for any alterations to show arrangements made by the organiser.

New  
Generation  
Software



# ARCANA

Joystick required.  
Commodore 64/128

**£8.95**

*Arcana, the Castle of Mysteries, holds the Dark Claricle, the most powerful Black Magic book ever known.*

*Batadur, the hero of the game, comes from the Land of Bright Elvys. His quest is to find the Dark Claricle and destroy it before its terrible knowledge falls in to the hands of the evil king Valarequil.*

*The smooth scrolling passages of Arcana are fiercely protected by all manner of harmful creatures which he must repel with his magic balls of lightning.*

*There are 30 finely detailed rooms with many secrets for our hero to discover. He needs 7 talismans to defeat the 7 demons that guard the book, then he must destroy it before its sinister writings are revealed to Valarequil!*

New  
Generation  
Software

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Name \_\_\_\_\_

Address \_\_\_\_\_

Please make cheques and postal orders to Virgin  
Games Limited and post to the address below.

Virgin Games Ltd 2, Vernon Yard,  
155 Portico, 110 Road,  
London W11 2DQ.  
Available for Commodore  
64/128 only.

## Popular Defence

In reply to Simon Mills' letter criticising my recent Ziggurat article I must confess that he is correct when he says that I am short-sighted and confused. I have been short-sighted since I was 12 years old and confused since I read his letter.

For newcomers to the debate, my article suggested that it was time that Basic was radically improved to match the recent advances in computer hardware and to meet the increased expectations of the discerning consumer. Mr Mills claims that enhancements to Basic would be "disturbing" and he particularly objects to the possibility that Basic might one day cope with *Manic Miner* type programs.

I am pleased that my article has led to some positive debate, although the opening remarks of Mr Mills' letter were particularly uncalled for. Perhaps I can allay some concern by expanding briefly on the parts of the article which Mr Mills found most offensive.

The Basic found on most home computers is unstructured and slow and therefore unsuitable for large, complex or fast applications. However, the language is easy to learn, easy to debug and is familiar to the vast majority of home computer users. Pascal, Ada and Cobol do not

share these advantages. It is therefore a sensible place to start from when designing the languages of the future.

Who wants *Manic Miner* type games written in fast Basic? The vast majority of *Popular Computing Weekly* readers, judging by the comprehensive survey published recently. No doubt the games would be inferior to those that machine code writers produce, but they would give individuals the satisfaction of writing their own games instead of playing other people's and allow computer users to be creative rather than submissive. A modest rather than a disturbing development, I would have thought.

Mr Mills would have us all struggling with *Gatos* and *Goats* on the transputers of the next century. Is that what most *Popular* readers want?

Mike Lloyd  
Gloucester

## Plugging Away

My best advice to I J Mackie (Letters, July 31), regarding his 9V Oric transformer, is to buy a Spectrum transformer, cut off the plug leading to the micro and rewire in reverse, i.e. the white wire to the outer terminal. You can buy the plugs from most electrical shops.

A C Symonds  
Hereford

## Amstraders Unite!

Having recently had to give up work to care for a disabled parent, I now find myself with quite a bit of idle time on my hands. To fill this time I would like to start a club for Amstrad CPC computer users.

For a very minimal subscription fee to cover costs, I would be willing to put together, edit, and circulate a monthly (or bi-monthly with help) newsletter, containing input from the subscribers in the form of news, views, reviews, listings—anything, in fact, to do with computing.

My aim would be to publish everything short of bad taste or libel, and part of the newsletter would be set aside as a soap-box for discussion and debate on matters trivial or profound.

Also, with enough input, I would hope to be able to build up and distribute a free software library of member's programs.

There must be oodles of nearly-good, unpublished programs out there that haven't been seen by anybody other than discerning editors and glassy-eyed parents. You never know, we might come up with a masterpiece between us.

So, come on Amstraders! Let's get together and show the professionals that we're

nearly as good as them, and probably twice as daft.

If you are even the teensy-weensiest bit interested, drop a line and a stamp to the above address, and I'll get back to you.

Jeff Walker  
75 Greatfields Drive  
Hillingdon  
Uxbridge  
Middlesex  
UB8 3QN

## Basic morality in basic

Mike Lloyd's article on the way forward for micro makers (Ziggurat, July 17) has been ridiculed by S J Mills (Letters, July 31), but I feel I must put all that has been said into perspective.

The article gave people a view of how their hobby will develop in the future and contained valid points on the retention of Basic.

For home use people will buy software on its merits, not the language it was programmed in.

However, we were informed by Simon Mills that the computer industry takes on few Basic programmers. This may be true, but the fact is that companies do not want self-taught programmers with knowledge of Pascal or Cobol, but they may well have no conception of a commercial environment.

continued page 9

# Puzzle

## Answer to Puzzle No. 216

Answer: There are 6561 different ways of drawing four cards from a pack of 36. Of these, 5983 can be arranged into a multiple of seven and 578 cannot. This represents a slightly better than 91 percent chance of success.

The program generates all of the draws possible with four cards out of thirty-six. These are lodged first in the array Z(4). For each set of four cards there are 24 possible arrangements. These are listed in the Data lines of the program and are called in turn. The array Z(4) is then transferred to array Y(4) in

the order determined by the Data statement. The resulting value is then tested for divisibility by 7. A flag (FL) is set to 1 if this is possible. If this can be done in at least one way then the 'win' variable is incremented. Note that the variable is only incremented once for each set of four cards, even though more than one different arrangement may result in a multiple of seven. This is because the question asks for the probability on the draw of the cards and not simply the number of arrangements possible.

## Puzzle No. 221

Take an ordinary chessboard and place a penny coin on each of the 64 squares. The coins should all be heads upmost. Now place the queen from a chess set on top of the coin on the top left-hand square.

Next, turn over the coins which lie on all squares which are 'attacked' by the queen, but not counting the square on which the queen is standing. Finally, remove the queen. If, and only if, the coin on which it is standing

is showing heads (which on this first square it is), then turn this coin over also.

Then move the queen along the row to the next square, and repeat the whole procedure — but remember the coin on which the queen now rests is tail upmost so this coin will not be turned when the queen is lifted. Continue along the row in this way, and then after reaching the end of the row move down to the next row, starting again on the left and moving a square at a time to the right.

In this way move over the entire board of 64 squares until finishing at the bottom right-hand corner.

At the end of the entire operation, what is the final 'pattern' of heads and tails left showing on the board?

## Winner of Puzzle No. 216

The winner this week is P Story of Ingham, Ross-on-Wye, who will be receiving £10.

## Rules

The closing date for Puzzle No. 221 is September 9.

```

10 DIM Z(4),Y(4)
20 FOR I=1 TO 4
30 FOR J=1 TO 36
40 FOR K=1 TO 24
50 FOR L=1 TO 24
60 Z(I,J,K,L)=INT(RND*36)+1
70 Y(I,J,K,L)=Z(I,J,K,L)
80 NEXT L
90 NEXT K
100 NEXT J
110 NEXT I
120 FOR I=1 TO 4
130 FOR J=1 TO 36
140 IF Z(I,J,1,1)=1 THEN Y(I,J,1,1)=2
150 IF Z(I,J,2,1)=1 THEN Y(I,J,2,1)=2
160 IF Z(I,J,3,1)=1 THEN Y(I,J,3,1)=2
170 IF Z(I,J,4,1)=1 THEN Y(I,J,4,1)=2
180 IF Z(I,J,1,2)=1 THEN Y(I,J,1,2)=2
190 IF Z(I,J,2,2)=1 THEN Y(I,J,2,2)=2
200 IF Z(I,J,3,2)=1 THEN Y(I,J,3,2)=2
210 IF Z(I,J,4,2)=1 THEN Y(I,J,4,2)=2
220 IF Z(I,J,1,3)=1 THEN Y(I,J,1,3)=2
230 IF Z(I,J,2,3)=1 THEN Y(I,J,2,3)=2
240 IF Z(I,J,3,3)=1 THEN Y(I,J,3,3)=2
250 IF Z(I,J,4,3)=1 THEN Y(I,J,4,3)=2
260 IF Z(I,J,1,4)=1 THEN Y(I,J,1,4)=2
270 IF Z(I,J,2,4)=1 THEN Y(I,J,2,4)=2
280 IF Z(I,J,3,4)=1 THEN Y(I,J,3,4)=2
290 IF Z(I,J,4,4)=1 THEN Y(I,J,4,4)=2
300 NEXT J
310 NEXT I
320 FOR I=1 TO 4
330 FOR J=1 TO 36
340 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
350 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
360 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
370 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
380 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
390 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
400 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
410 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
420 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
430 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
440 IF Y(I,J,3,3)=1 THEN Y(I,J,3,3)=0
450 IF Y(I,J,4,3)=1 THEN Y(I,J,4,3)=0
460 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
470 IF Y(I,J,2,4)=1 THEN Y(I,J,2,4)=0
480 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
490 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
500 NEXT J
510 NEXT I
520 FOR I=1 TO 4
530 FOR J=1 TO 36
540 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
550 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
560 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
570 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
580 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
590 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
600 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
610 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
620 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
630 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
640 IF Y(I,J,3,3)=1 THEN Y(I,J,3,3)=0
650 IF Y(I,J,4,3)=1 THEN Y(I,J,4,3)=0
660 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
670 IF Y(I,J,2,4)=1 THEN Y(I,J,2,4)=0
680 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
690 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
700 NEXT J
710 NEXT I
720 FOR I=1 TO 4
730 FOR J=1 TO 36
740 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
750 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
760 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
770 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
780 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
790 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
800 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
810 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
820 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
830 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
840 IF Y(I,J,3,3)=1 THEN Y(I,J,3,3)=0
850 IF Y(I,J,4,3)=1 THEN Y(I,J,4,3)=0
860 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
870 IF Y(I,J,2,4)=1 THEN Y(I,J,2,4)=0
880 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
890 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
900 NEXT J
910 NEXT I
920 FOR I=1 TO 4
930 FOR J=1 TO 36
940 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
950 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
960 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
970 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
980 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
990 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
1000 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
1010 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
1020 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
1030 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
1040 IF Y(I,J,3,3)=1 THEN Y(I,J,3,3)=0
1050 IF Y(I,J,4,3)=1 THEN Y(I,J,4,3)=0
1060 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
1070 IF Y(I,J,2,4)=1 THEN Y(I,J,2,4)=0
1080 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
1090 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
1100 NEXT J
1110 NEXT I
1120 FOR I=1 TO 4
1130 FOR J=1 TO 36
1140 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
1150 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
1160 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
1170 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
1180 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
1190 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
1200 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
1210 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
1220 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
1230 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
1240 IF Y(I,J,3,3)=1 THEN Y(I,J,3,3)=0
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1260 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
1270 IF Y(I,J,2,4)=1 THEN Y(I,J,2,4)=0
1280 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
1290 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
1300 NEXT J
1310 NEXT I
1320 FOR I=1 TO 4
1330 FOR J=1 TO 36
1340 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
1350 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
1360 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
1370 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
1380 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
1390 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
1400 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
1410 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
1420 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
1430 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
1440 IF Y(I,J,3,3)=1 THEN Y(I,J,3,3)=0
1450 IF Y(I,J,4,3)=1 THEN Y(I,J,4,3)=0
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1480 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
1490 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
1500 NEXT J
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1540 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
1550 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
1560 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
1570 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
1580 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
1590 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
1600 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
1610 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
1620 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
1630 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
1640 IF Y(I,J,3,3)=1 THEN Y(I,J,3,3)=0
1650 IF Y(I,J,4,3)=1 THEN Y(I,J,4,3)=0
1660 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
1670 IF Y(I,J,2,4)=1 THEN Y(I,J,2,4)=0
1680 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
1690 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
1700 NEXT J
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1740 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
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1760 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
1770 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
1780 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
1790 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
1800 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
1810 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
1820 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
1830 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
1840 IF Y(I,J,3,3)=1 THEN Y(I,J,3,3)=0
1850 IF Y(I,J,4,3)=1 THEN Y(I,J,4,3)=0
1860 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
1870 IF Y(I,J,2,4)=1 THEN Y(I,J,2,4)=0
1880 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
1890 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
1900 NEXT J
1910 NEXT I
1920 FOR I=1 TO 4
1930 FOR J=1 TO 36
1940 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
1950 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
1960 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
1970 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
1980 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
1990 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
2000 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
2010 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
2020 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
2030 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
2040 IF Y(I,J,3,3)=1 THEN Y(I,J,3,3)=0
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2060 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
2070 IF Y(I,J,2,4)=1 THEN Y(I,J,2,4)=0
2080 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
2090 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
2100 NEXT J
2110 NEXT I
2120 FOR I=1 TO 4
2130 FOR J=1 TO 36
2140 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
2150 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
2160 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
2170 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
2180 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
2190 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
2200 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
2210 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
2220 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
2230 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
2240 IF Y(I,J,3,3)=1 THEN Y(I,J,3,3)=0
2250 IF Y(I,J,4,3)=1 THEN Y(I,J,4,3)=0
2260 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
2270 IF Y(I,J,2,4)=1 THEN Y(I,J,2,4)=0
2280 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
2290 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
2300 NEXT J
2310 NEXT I
2320 FOR I=1 TO 4
2330 FOR J=1 TO 36
2340 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
2350 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
2360 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
2370 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
2380 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
2390 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
2400 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
2410 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
2420 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
2430 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
2440 IF Y(I,J,3,3)=1 THEN Y(I,J,3,3)=0
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2460 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
2470 IF Y(I,J,2,4)=1 THEN Y(I,J,2,4)=0
2480 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
2490 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
2500 NEXT J
2510 NEXT I
2520 FOR I=1 TO 4
2530 FOR J=1 TO 36
2540 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
2550 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
2560 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
2570 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
2580 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
2590 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
2600 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
2610 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
2620 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
2630 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
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2660 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
2670 IF Y(I,J,2,4)=1 THEN Y(I,J,2,4)=0
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2690 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
2700 NEXT J
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2720 FOR I=1 TO 4
2730 FOR J=1 TO 36
2740 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
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2760 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
2770 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
2780 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
2790 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
2800 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
2810 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
2820 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
2830 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
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2860 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
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2880 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
2890 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
2900 NEXT J
2910 NEXT I
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2940 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
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2960 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
2970 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
2980 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
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3000 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
3010 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
3020 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
3030 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
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3090 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
3100 NEXT J
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3120 FOR I=1 TO 4
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3140 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
3150 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
3160 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
3170 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
3180 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
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3220 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
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3300 NEXT J
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3830 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
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3870 IF Y(I,J,2,4)=1 THEN Y(I,J,2,4)=0
3880 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
3890 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
3900 NEXT J
3910 NEXT I
3920 FOR I=1 TO 4
3930 FOR J=1 TO 36
3940 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
3950 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
3960 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
3970 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
3980 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
3990 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
4000 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
4010 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
4020 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
4030 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
4040 IF Y(I,J,3,3)=1 THEN Y(I,J,3,3)=0
4050 IF Y(I,J,4,3)=1 THEN Y(I,J,4,3)=0
4060 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
4070 IF Y(I,J,2,4)=1 THEN Y(I,J,2,4)=0
4080 IF Y(I,J,3,4)=1 THEN Y(I,J,3,4)=0
4090 IF Y(I,J,4,4)=1 THEN Y(I,J,4,4)=0
4100 NEXT J
4110 NEXT I
4120 FOR I=1 TO 4
4130 FOR J=1 TO 36
4140 IF Y(I,J,1,1)=1 THEN Y(I,J,1,1)=0
4150 IF Y(I,J,2,1)=1 THEN Y(I,J,2,1)=0
4160 IF Y(I,J,3,1)=1 THEN Y(I,J,3,1)=0
4170 IF Y(I,J,4,1)=1 THEN Y(I,J,4,1)=0
4180 IF Y(I,J,1,2)=1 THEN Y(I,J,1,2)=0
4190 IF Y(I,J,2,2)=1 THEN Y(I,J,2,2)=0
4200 IF Y(I,J,3,2)=1 THEN Y(I,J,3,2)=0
4210 IF Y(I,J,4,2)=1 THEN Y(I,J,4,2)=0
4220 IF Y(I,J,1,3)=1 THEN Y(I,J,1,3)=0
4230 IF Y(I,J,2,3)=1 THEN Y(I,J,2,3)=0
4240 IF Y(I,J,3,3)=1 THEN Y(I,J,3,3)=0
4250 IF Y(I,J,4,3)=1 THEN Y(I,J,4,3)=0
4260 IF Y(I,J,1,4)=1 THEN Y(I,J,1,4)=0
4270 IF Y(I,J,2,4)=1 THEN Y
```



With the removal of the industrial factor from the choice of language, free choice must prevail. Basic suits the needs of most programmers; therefore, condemnation of the language and, in turn, its users seems pointless.

The moral is, let the micro industry develop and don't cloud it with uneducated statements on the subject of programming.

Mark Hudson  
Ipswich

## Betrayed by Commodore

I have a faulty Commodore 128, and I have been waiting three months, for Vic Odds, my dealer, to get a new C128 in to exchange it. Now I have been told by Vic Odds that there would be no more 128s. This prompted me to ring *Popular Computing Weekly* three weeks ago explaining my predicament.

I also phoned Commodore

at Corby, and spoke to someone in the marketing department, who assured me that there were no supply difficulties and that they were not discontinuing the C128.

I now feel very upset and betrayed by Commodore. I've had a Vic 20, Commodore 64 and Commodore 128, so you can see I've been loyal to the Commodore range.

I feel that had the C128 been supported in the way that the Amiga has – for instance the amount of space and promotion devoted to the Amiga at the recent Commodore show at Novotel – then the history of the C128 would be very different.

There seems to have been a recent succession of Commodore machines that do not last very long – the C16, Plus/4.

If they carry on letting their machines die in such a short space of time, people are going to feel apprehensive about buying the Commodores.

Miss Gemma Hewitt  
Sydenham  
London

## After Kasparov v Karpov

This is your first move in the game between you and Colossus 4 Chess. As you can see from the diagram, you have the chance to play in both of the games below.

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You play Black in game one and White in game two. Please send your next move for each game, ie, the moves marked ? in the diagram, on a postcard or stuck-down envelope, to *Popular Chess*, Unit 11, South Block. The Maltings, Sawbridgeworth, Herts CM21 9PG. Your move must reach us by August 28. No correspondence concerning your moves can be entered into.

Game 1	Game 2
White Black	White Black
1 P e2e4 ?	?

The most popular move suggested by entrants will be entered into the game, and Colossus will then make its reply.

The next moves will be printed on the Letters page in two weeks' time, with reports on the game's progress in our monthly chess column.

And please bear with us while we go through the not-so-exciting opening stages of the game—we'll get to the nitty-gritty of the middle game soon enough.

### Prizes

A British Museum reproduction Arran Chess set will be awarded to the reader who suggests the greatest number of accepted moves at the end of the game. So those who send a card for each move have a better chance than those who only send one occasionally.



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# Computers vs Humans

*Martyn Bryant makes his opening move in a new regular column on computer chess*



Playing chess against the computer is one of the most popular pastimes for many micro users. This new series has two different aims. Every month, we'll be bringing you an update on the latest goings-on in the computer chess world, with hints and tips, chess programming techniques and tournament reports.

In addition to that, *Popular* is running a fortnightly computer chess game, between you, the readers, and *Colossus 4 Chess*. Every other week, on the Letters page, you'll find a coupon to fill in your choice of move in the *Popular vs Colossus* game. By the next week, *Colossus* will have made its reply, and then it's up to you again. See this week's Letters page for full details and how to play. In our monthly columns, we'll keep you posted on the game's progress.

This week, however, we're going to look at how computer chess has developed over the years.

In the 1984 World Championships, after a program (which will remain nameless) made its umpteenth bad move, the programmer concerned was overheard to say that his program wasn't based on "artificial intelligence" but on "artificial stupidity"!

If you look around the chess programs that are suitable today, from the cheapest micro to the mightiest super-computer, it is often easy to understand the programmer's frustration. Although computer chess has made giant leaps since its birth in 1950, we are probably still several decades away from a computer becoming world champion and if it did it couldn't hold a conversation with Wogan as Gary Kasparov almost managed!

But is this fair to the programs? Of course not (but then I'm biased). Computer chess is only 36 years old, whereas chess has been played by humans for many hundreds of years. The wealth of chess literature is mountainous and analyses of games played hundreds of years ago are still in print today. The human "software" library is awesome.

**"Computers can play better than 99% of the world's human players"**

Programmable computers have only been around about 40 years, but the human brain (our "hardware") has been million of years evolving. Of course it's difficult to compare computer chess directly with human chess because of the completely different "software/hardware" used.

A computer program consists of tens of thousands of binary numbers which would be meaningless to a human. But can a computer read a chess book? Even if it was capable of character recognition, could it then "understand" the language? And even then could it apply that knowledge to an actual game? Certainly not yet.

A computer processor can execute several millions of instructions a second, but unfortunately it does this serially.



Computer chess

The human brain's synapses fire in milliseconds, but the brain has literally billions of connections which can fire independently, thus making the processing power of our brains far greater than all the multi-million pound super-computers of today put together.

How then can computers play better than 99% of the world's human players? Firstly, because 90% of the human players are pretty bad anyway. The top 10% or less are the hobbyists, club players, masters, grandmasters, etc, who take their game seriously. However, even now the best programs are, in

certain cases and some aspects of the game, playing master level chess.

Secondly, the computers use totally different methods of picking the "best move" from those used by us humans. They use systems like minimax-tree-searching, move-generators, alpha-beta-pruning, evaluation-functions, etc.

Although any human can understand how these algorithms work, we could not possibly use them to play chess ourselves because of their serial nature. They were designed for computers to use and have been refined and added to over the years and now the "computer-thought" way of playing chess can challenge all but the very best "human-thought" players.

All this has been achieved in a few decades by the endless dedication of perhaps only a hundred or so addict programmers. If millions of programmers had studied the task for hundreds of years then computer chess programs would surely be unbeatable.

When can we expect a computer to beat the human world champion, though? In the 1960s, the top chess programmers were just as unsure as they are today. Estimates ranged from a "few years" to "many decades" and they still do.

Martyn Bryant is the programmer of *Colossus 4 Chess*.

Martyn Bryant welcomes any comments, queries or correspondence from readers. You can write to him at Unit 11 South Block, Riverside Way, The Maltings, Sawbridgeworth, Herts, CM21 9PG.

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# The Bondwell 34: the PC war begins

**"To produce a PC all you need is CPU, O/S and BIOS, a bag of Ram chips, sundry connectors and bits like disc drives and power supply and you're away." John Lettice reports on the newest PC**

**T**echnically there's nothing particularly remarkable about the Bondwell PC, just as there was nothing remarkable about the IBM PC when it was launched a few years back. But, like it or not, the IBM has to all intents and purposes taken over the business micro world, and as its imitators, hotly pursued by IBM itself, come down in price the IBM standard is shaping up to expand down into the home and small business markets.

The Bondwell, at £690 for 640K twin 360K disc system, is one of the first signs that this is happening – Opus, Amstrad and sundry others will follow in September, and we could see a full-blown PC war erupting this Autumn.

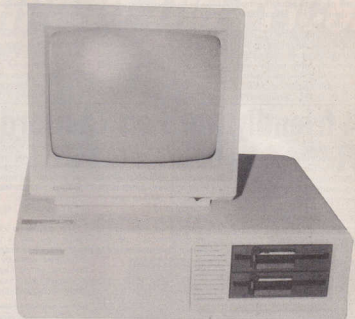
The success of the PC standard is often ascribed to IBM's name, but although this has obviously helped the PC's design is equally important.

In terms of format an IBM standard PC is a largely empty box with space inside to house two disc drives (hard or floppy) and anything from five to seven standard expansion cards that can house extra memory and most – sometimes even all – of the machine's I/O. End users can therefore tailor systems to their own requirements, adding Ram, serial and parallel interfaces and high resolution/colour monitor cards as they please.

The internals have a similarly plug in respect to them. The machine is built around an Intel CPU of the 8086 series. The original PC used the 8088, while the faster compatible machines use the 8086, and the AT, IBM's follow-up to the PC, uses the 80286, IBM doesn't own the rights to these chips, so they can all be bought off the shelf.

The BIOS (Basic Input/Output System) is proprietary to IBM, and insofar as the box has any personality this is where it resides. The machine's operating system is however loaded in from disc, so the BIOS isn't complicated, and numerous companies have been able to produce compatible versions without infringing IBM's copyright.

The operating system, MSDOS, can be bought in from Microsoft, so to



produce a PC all you need is CPU, O/S and BIOS, a bag of Ram chips, sundry connectors and bits like disc drives and power supply and you're away.

This is exactly what manufacturers in Korea, Taiwan, Singapore and Hong Kong have been doing for some time now, and while the Bondwell isn't the first of these to appear in this country it's currently one of the cheapest.

The Bondwell box is one of the more basic of the genre, particularly close to MSX Basic, major differences being screen-related commands. Sound is however the same, although IBM look-alikes only use one channel.

Other software is liable to be a problem in the short term, as IBM programs are traditionally priced high, but the arrival of the Amstrad PC plus a bit of judicious bandwagon climbing by the software houses should bring the cost down to more affordable levels.

In some ways the dominance of the IBM PC worldwide is depressing. It's bulky, low-tech and the screen handling

messy to say the least. It's not the machine the gods ought to have chosen to rule the world, but they have, the software's there, and there are enough people out there working on the PC standard to make it an effective business tool, as opposed to an end in itself.

The original product from IBM has the additional problem of being grossly overpriced, and here we come to the upside. Companies like Bondwell are proving that it costs no more to produce a high-spec business machine than it does a home one, and companies like Amstrad, Spectrum and Opus are starting to pass these savings – to the consumer, and the logical conclusion of the machine's entry into the mass market will be better and cheaper software. And that certainly will be good news.

**Hardware Bondwell 34 Price £690**  
Supplier Spectrum Group, Hunting Gate, Hitchin, Herts SG4 0TJ (0462 37171)

# Nucleon: only the idea was sound

**N**ucleon, from French company Pyramide, is supposed to be an all in one programmers aid covering graphics, character set design, windows and sound.

The problem is that those who really can program won't need the facilities offered here and those who can't program need more. So, who is the package actually aimed at then? Well, presumably, it's the person who knows their way around the QL pretty well without being in the new professional, class. Unfortunately, this person will know enough so that *Nucleon* offers nothing new, especially as it is largely programmed

in Basic.

The Compact draw program enables you to create drawings which are then turned into basic commands, for incorporation into your own programs, thus saving considerably on the 32K nor-

mal design of course, is of potentially much more use although the method of actually designing said characters is somewhat tortuous.

Windows lets you design your own viewpoints on life but again the level of pro-

gramming is not highly sophisticated. Maestro lets you get away from the QL's *Beep* command and provides a method of writing little tunes painlessly. If you're no great shakes musically then Maestro should help you to churn out some-

thing reasonable. Even so, with only one channel and two octaves to play with no matter how hard you try the finished product will never resemble the sort of music produced by Commodore 64 games.

*Nucleon* is trying to be all things to everyone but in fact is only a few things to a very few people.

♦♦

Duncan Evans

**"Nucleon is for the person who knows their way around"**

ally needed for a saved screen. The theory sounds fine, what it boils down to though is fairly crude line drawings which the programmer could probably write anyway.

The Characters program, which deals with character

gramming is not highly sophisticated.

Maestro lets you get away from the QL's *Beep* command and provides a method of writing little tunes painlessly. If you're no great shakes musically then Maestro should help you to churn out some-

**Program Nucleon Price**  
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# A friendly word on Tasword and Tasprint

**R**eleasing a new word processor for the PCW machines is a bold move even when the program in question is very cheap and also successful on other machines. What features are there available with *Tasword* 8000 that would attract users away from *Locoscript*?

Firstly, *Tasword* is a remark-

ably easy program to get to grips with – the help menus are so self evident and extensive and the options available so straight-forward that there is almost no need to refer to the manual at all.

This is not to suggest it is unsophisticated. Indeed, it is an improvement on the *Taswords* released to date – it is

faster and has some welcome additions – you can embed markers in the text for example to help you move around, quickly, merge files at the cursor position, and the find/replace is vastly improved.

The display is completely 'what you see is what you get' and *Tasword* has also pioneered whereby you can use the arrow keys to get anywhere you like on the page to begin typing – just

like a pen and paper. It's a small point but impossible on most word processors and a very friendly feature for beginners.

*Locoscript* has many excellent features – templates, embedded format rulers, multiple block storage, alternate header/footers, etc – but *Tasword* can challenge these with a word count, four notepads for jotting reminders, an extensive scientific/foreign character set and two extra fancy fonts supplied for printing.

**"Locoscript has many excellent features"**

like a pen and paper. It's a small point but impossible on most word processors and a very friendly feature for beginners.

*Locoscript* has many excellent features – templates, embedded format rulers, multiple block storage, alternate header/footers, etc – but *Tasword* can challenge these with a word count, four notepads for jotting reminders, an extensive scientific/foreign character set and two extra fancy fonts supplied for printing.

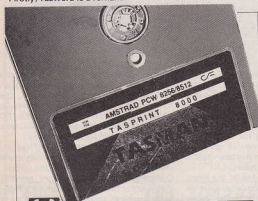
*Tasword* works with pure Ascii text which makes it suitable as an editor for program listings, etc, and at least readable by almost any other uti-

lity available. It is also invaluable for editing and re-formatting any Ascii files you may have created by transferring data down a modem or between different utilities. A quite sophisticated mail merge option is capable of making tests on the data supplied to decide what to print. The only feature this lacks is the ability to re-format the text prior to printing meaning that a ragged right edge is inevitable.

Perhaps its greatest strength is the fact that the Ram of the M drive is used by the program for directly storing the text as you type it. Very large files can thus be created, about 100K on the 8255 and over 300K on the 8512. Because text is held in Ram moving around large files and making changes is very very much faster than with *Locoscript* or any other word processor I know.

*Tasprint* 8000 supplies another six fonts that can be used with *Tasword*, directly with an Ascii file or via a sort of direct 'typewriter' option.

Tony Kendle



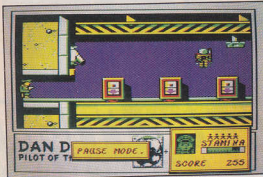
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# Dan Dare: The reincarnation



**A**t last! A licensing deal that lives up to the standards of the original. After the rubbishing that James Bond and Superman received at the hands of software producers, it's nice to see Virgin doing old Dan Dare proud.

I don't recall seeing better graphics on the Spectrum, and the Commodore and Amstrad graphics are up there with the best. Dan looks like the Dan we know and love, the Mekon looks suitably evil, and the animation of all parties is flawless. All versions feature authentic comic-book

style captions and running commentaries at the foot of the screen.

And the background graphics are terrific – solid, multicolour backdrops with metallic-looking girders and pipes, gravity lifts with moving indicators and blinking lights, and walls and cells which Dan runs in front of, and behind, with, on the Spectrum, not an attribute problem in sight.

The sound on the Spectrum is confined to the deadly sound of laser fire, but the capabilities of the other two machines are used to good effect.

The scenario is classic Dan Dare. The Mekon has launched a hollow asteroid at the Earth, and Dan has only two hours to destroy it.

He (you) does this by finding control keys for a self-destruct device hidden in various locations. Find all five keys, get off the rock in time, and it's party time on planet Earth.

Fail and... well, when did Dan Dare ever fail? Of course it's no stroll in the

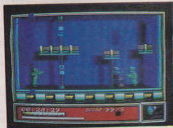
trifles like these, he can be knocked out and transported to a prison cell which costs ten precious minutes – and the clock is ticking away in real time.

Full marks to Virgin for this one. The production is superb, and it's tough enough to keep you playing for weeks.

Dan Dare deserves an immediate Number One spot. **Popular Appeal: ★★★★★**

Peter Worlock

Above left: *Dan Dare*, the Amstrad version. Right: *Dan Dare* on the Spectrum. All versions to be released in September.



park. Apart from ceiling-mounted laser batteries, and even trickier kneecapping devices, there are squads of patrolling Treens to be dealt with.

Although Dan is too tough to be killed by piffing little

**Program Dan Dare Micro**  
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**Supplier** Virgin Games, 2-4 Vernon Yard, Portobello Road, London W11.

# Leaderboard scores above par

**T**he C64 *Leaderboard* was a pretty good game but suffered with the unrealistic setting of islands in the middle of a lake – hardly Wentworth! The ST version corrects all these faults and provides an almost perfect game by incorporating hazards such as rough,

end of a joystick plug, which you must insert into joystick port two before the start of play or the system throws a wobbly and resets itself.

After all the pre-match preparations have been done, it's out on to the course you go to face the first hole. Once you've selected which club

ible faults with the game. One is the occasional flickering around the edge of the golfer as he plays a shot and the other is the hefty price tag of £40. However, niggling aside, *Leaderboard* is a truly superb game, the best to appear for the ST so far.

**Popular Appeal★★★★**  
June Pidgeon

**Program Leaderboard Micro** Atari ST **Price** £39.95 **Supplier** Silica Shop, 1-4 The Mews, Hatherly Road, Sidcup, Kent DA14 4DX.

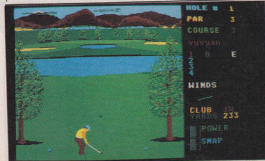
*"Leaderboard is a truly superb game, the best to appear for the ST so far"*

bunkers, water and nicely drawn trees into a realistic golf course (although it's pretty flat except for the green).

The first hazard of the game, though, is the dongle, represented by the mutilated

you're going to use, and lined up the shot, it's the moment of truth on the power/snap indicator, where you attempt to avoid slicing or hooking the ball.

There are only two discern-





# When crime doesn't play

After several hours play and no points scored, it became apparent that *Miami Vice* is more a problem of genetic engineering than of game playing. Assuming that humans – or at least the nearest to humans *Popular* could find – can't handle it, and that it will take several billion years for natural selection to produce the sort of hairy-palmed, slaver loon that can, building your own is the only logical solution.

Even as I write a semi house-trained part-Vulcan Battle Droid is driving along through the streets of Miami in search of Mr. Big, but there seems little hope of success, the game's script being infinitely easier to grasp than the game itself. The object is to bust the perpetrators of a major drugs deal which is, as they say, going down. Or that's what the word on the street is saying at any rate.

To do this you drive from

bar to bar, dodging innocent civilian cars – which seem to have about as much road sense as the average digestive biscuit – busting small time hoods to amass evidence.

Your precinct captain has thoughtfully provided you with a schedule of meetings, so if for example you wish to arrest Sharky, you know he'll be at Vines Bar at 1.20pm. Or 8.40pm, 7pm or 4.20pm... Yes, that's right, there are several lists. If you catch a villain you, of course, know which is the correct list, and can therefore, theoretically roll up the rest of the mob... theoretically.

The meet is your next problem. Every second in real time is a minute in the game, and to catch a crook you have to arrive between four and eight seconds after the meeting starts. So you have to drive up, park without getting shunted by one of the digestive biscuit brains, get out of



the car without catching your trendy jacket in the door, and get into the bar within that four seconds. The fact that the *Popular Battle Droid* has now managed this several times I'd regard as a tribute to the perfectability of humanity.

Assuming you have managed to pick up crooks or evidence you then have to brave the traffic (see biscuit brains, above) to take them back to City Hall. So far no one at *Popular* has got as far as a second bust. But it seems to be possible, and I'm now inclined to agree with Ocean that it is very difficult, but is nevertheless playable; just.

You'll need a lot of perseverance to get to grips with this game and you might well find it so frustrating after the first couple of hours that you put it aside and never go back. But if you set aside enough time to get into it, it'll probably repay you with hours of entertainment.

**Popular Appeal ♦♦♦♦**  
**John Lettice**

**Program** *Miami Vice Micro* Commodore 64/128  
**Price** £8.95 **Supplier**  
Ocean Software, Ocean House, 6 Central Street, Manchester M2 5NS.

# Mindstone classic

*Mindstone* is a beautifully-presented graphic adventure set in the traditional mould, complete with dwarves, princes, spells, magic rings and all the usual monsters. Your party of four, led by Prince Kyle, consists of the usual cross-section of rabble, each of which has varying Strength, Psyche power and so on.

As in most adventures, play consists of exploring the locations, picking up objects and using them in the required way. Most of the puzzles aren't too taxing: for example, your way is blocked at one point by an Ice Wall, and you may have picked up a Fireball spell elsewhere – there is a bar of Lead to be found, and also an Alchemy spell.

The programming, by John Pitcher, is impeccable, from the unique loading screen onward (apart from two mistakes, one a spelling error

early on, and the other much more serious, see later).

The adventure is menu-driven, with no text input, though control of the program may be chosen by the player; the faster way is to use the keyboard, on which certain keys are assigned to certain commands (E = Eat for example). You may also play with the joystick via icons; it is rather neat, and although the icons are a lot slower I found that the program crashed every time I used the keyboard method.

*Mindstone* is a minor classic and I look forward to sequels (Hint, Hint, Edgel).

**Popular Appeal ♦♦♦♦**  
**Tony Bridge**

**Program** *Mindstone Micro* Spectrum Price  
£9.95 **Supplier** The Edge,  
36-38 Southampton Street, London WC2E 7HE.

# Cauldrons too

Super fun this one; sequel to the impressive *Cauldron*, and if anything even more challenging and rib-tickling. In *Cauldron* you controlled a witch, flying around a planetoid collecting keys and fighting the Pumpkin King. In *Cauldron Two*, you, yes, you, are that very Pumpkin King! Zowie! The pumpkin is completely legless (no, I don't mean it's been at the magic potion), so it has to bounce around the 'castle' under joystick control.

Your quest is to find the magic objects which will allow you to defeat the Queen of the Witches, overcoming the various skeletons, bats, ogres, magic weapons and fires which will deplete your magical energy should you encounter them. If you can find a magic spark, you can use it as a weapon, zapping your adversaries by pressing the fire button and controlling

the spark with the joystick. Otherwise, your only hope is to bounce over the baddies, controlling the height of your bounce carefully to avoid jumping out of one scene into another.

Each time you lose a life the witch queen, depicted at the top of the screen, gives a convincing cackle which should spur you on to greater efforts to defeat her. Great music by Richard Joseph, and the usual top-class design and programming from Steve Brown and Richard Leinfellner, add up to a superior entertainment for your Amstrad.

**Popular Appeal ♦♦♦♦**  
**Chris Jenkins**

**Program** *Cauldron Two Micro* Amstrad CPC  
464/664 Price £8.99  
**Supplier** Palace Software, 275 Pentonville Road, London N1.

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# Give your cat more than nine lives

A fistful of pokes from Tony Kendle this week, for *Quazatron*, *Match Point*, *Pyramide's 3D Wanderer* and *Ghosts and Goblins*

This week we are going to continue in *Popular's* fine tradition of supporting minority micros, as long as there are enough interested owners to help us do so, by printing another welcome letter from an old friend, Allan Jarvis of Benfleet, who some time ago sent in some pokes for the QL game EVA.

Allan begins by saying, "I must disagree with the good review you gave the QL game *3D Slime* which in my opinion is too slow, being written in Basic and compiled with the *Supercharge* compiler."

**"I found the game charming and quite addictive - my own feeling is that technical wizardry is far less important than a good game design"**

You have a point about the game's speed, Allan, but I still found it charming and quite addictive - my own feeling is that technical wizardry is far less important than a good game design. Some of my very favourite releases are both quite old and very simple and make even *3D Slime* look like something running on the Amiga but they can be just as gripping as when first released.

Anyway, the letter continues, "A much better game is *3D Wanderer* by the French company Pyramide. The three-dimensional graphics are stunning. Given all the reported remarks about the problems with screen handling on the QL it is amazing that they are so quick. After playing the game for about a month and only getting to ability level five, I decided to look for a chat routine so that I could try the black holes, meet the sphinx and finish the game.

"I discovered the following pokes which allow the number of shields, energy level, number of cats (sic), and ability level to be set before the game starts. Load the Boot program and add the following lines:

```
80 a=RESPIRO)
82 POKE-L 886+a, 0
84 POKE-L 886+a, 0
85 REMark set shields 0-255
86 POKE 893+a, 255
```

```
87 REMark set energy 0-31000
88 POKE-W 898+a, 31000
89 REMark set cats 0-8000
90 POKE-W 18474+a, 8000
91 REMark set ability 0-10
92 POKE 18476+a, 10
```

"The program can then be run or re-saved to your backup cartridge.

"Another fantastic program is the QL version of Psion's tennis game, *Match Point*. It is possible to cheat, however - try pressing the function keys in one player mode before you serve."

Thanks for the letter, Allan, look forward to the next one.

Moving now to the Spectrum, we've had a letter from Andrew Brown writing about the excellent game *Quazatron*.



from Hewson Consultants. *Quazatron*, of course, is the game that looks like a cross between *Spindizzy* and Hewson's Commodore release *Paradroid*.

Andrew writes, "This program makes your droid completely indestructible, ie, you cannot die and you cannot lose your extra parts. Simply type in and run the following and follow the on-screen instructions."

```
5 REM Quazatron Pokes by ABR
10 CLEAR 2553: FOR N=23296 TO 23320: READ A: POKE N+A, NEXT N
20 PRINT TAB 8; "PLAY QUAZATRON TAP";
LOAD "" CODE
340 RANDOMISE USR 23296
100 DATA 33,9,91,34,116,133,195,10,133,
205,86,5,33,220,224,34,99,228,62,195,
50,98,228,225,233
```

To finish off this week I can just squeeze in a tip for Commodore owners who have both *Elite's* *Ghosts and Goblins* and a reset switch. The tip comes from Ronnie Farrington of Bidston:

"Load the game, reset it and type *Poke 2358, 141* (Return) to get unlimited lives. To run the game type *Sys 2128*."

## Charts

### Top Twenty

- 1 (2) Speed King
- 2 (1) Dragon's Lair
- 3 (15) Thrust
- 4 (8) Ninja Master
- 5 (7) ACE
- 6 (4) Ghosts and Goblins
- 7 (3) Green Beret
- 8 (10) Kick Start
- 9 (5) Leaderboard
- 10 (11) Molecule Man
- 11 (19) Kane
- 12 (13) Jack the Nipper
- 13 (14) Formula One Simulator
- 14 (18) Knight Tyme
- 15 (-) Spellbound
- 16 (6) Video Olympics
- 17 (12) Kung Fu Master
- 18 (9) One Man and his Droid
- 19 (-) Stainless Steel
- 20 (16) Knight Games

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# Bulbo Biggun and Bimbo Faggins in The Boggit

Tony Bridge compares McNeill's and Wilson's variations on a theme



It seems many years ago now that Thorin started to bore the pants off me with all that singing about Gold (and I always expected rather more to come of it, thinking that here was a major clue to the rest of the game; alas, it was not to be). Now, along comes his cousin, I horny, and he has a song of his own:

"Gold, it is a yellow metal/more nicer than copper or brass/A Dragon pinched mine but I'll settle/with kicking him up the..." This is where the censor catches up with Fergus McNeill and CRL/Delta 4.

I never cease to be amazed at what can be achieved with *The Quill*; but one ingredient that must be supplied by the author is imagination. Without this, *The Quill* becomes a boring utility which produces sausages – but there's no chance of that with the two adventures we're looking at this week.

Philip Mitchell's watershed adventure, *The Hobbit*, has been ripe for a parody and at this moment Fergus McNeill is one of the few writers with the courage (and talent) to undertake this task – although John Wilson, whose name appears regularly in this column and others (and who must thank for his help in many adventures, some of which I would have given up on) recently sent me a very good effort of his own, also Quill'd and also called *The Boggit*.

The two versions approach the parody from different directions; John attempts to evoke the atmosphere of Tolkien's book as well as the game (and does a good job, considering the shortcomings of the medium, despite failing to the temptation of the occasional McNeill-ism such as Grand Alf's Denim jumpsuit and Nike trainers. Fergus is content to take the game itself apart and reconstruct in his unique way, creating a typically lunatic world.

I'm glad to be able to report that in CRL's 3-part story, you'll find no C5s (although there is an Australian heavy orc band), and the jokes mostly stay this side of the taste barrier. As usual, Fergus has used his Quill with the usual sickening and mind (mine) – numbing ease – he started to really get to grips with the utility round about the time of *The Joy-stick* series (and if you haven't seen this

epic saga, do yourself a big favour and rummage through the bargain bins or even contact Delta 4 direct (Room 101, The Shieling, New Road, Swanmore, Hants SO3 2PE). Certainly no-one has done so much with the program.

The pictures adorning *The Boggit*, Bored 20 are pretty faithful reproductions of those in the original (though there is the usual Graphics On/Off facility available), and speaking of pictures, there is also on the cover the by-now obligatory parody of the "Map of the Fantasy Land" (Wilberland in this case). But it is the text that makes *The Boggit* a classic and the best Delta 4 adventure yet.

**"The Boggit is set to become a classic adventure"**

Splitting the adventure into three parts has allowed McNeill to write ream after ream of craziness, with adventuring in-jokes galore. All this is very attractively laid-out, with a very legible, vaguely Middle Earthian character set and lots of colour. *The Patch* is used to some extent, allowing Ram save and load – there isn't much sound, although the sequence I mentioned earlier, of Grandalf's gift, seems to have been contrived mainly because there was a nice explosion effect lying around somewhere!

Thankfully, also to be found are all the lovable McNeill spelling mistakes (a Delta 4 story wouldn't be the same without 'em). Along with the three parts of *The Boggit*, the tape from CRL includes *Sceptical Part Two*. For those who missed Part One, this is Delta 4's answer to Micronet and includes some very strange pages of chat.

This is the way most of the story continues; the usual location description, followed by several screens of typical Delta 4 humour. There are several objects lying around, but you must beware of using them in the wrong situation, as some from the first part must be carried over to the second. This is the only drawback with a multi-part story, of course; if you find that you need an

object from the previous section, then you must re-load the whole part. It's rather easy to progress through the first part in particular without coming up against an impassable situation, and all too easy (though a subtle warning is given) to stumble into the second part with no return possible, short of re-loading (and even saving to Ram won't help you back out here). The tough puzzles start in the second part, and, I'm reliably informed, only get harder.

*The Boggit* is that rarity, a parody that surpasses the object of its parody. Set to become a classic, it demands a place in the collection of any self-respecting adventurer.

Just about most of whom will have a version of the original adventure, *Colossal Cave*. Or at least, what we have always assumed was the original – those resourceful people at St Bride's School for Gentlemen have unearthed the real original, known, of course, as *The Very Big Cave Adventure*.

Again, it is Quill'd, Patched, and Illustrated, and you will know by now that the St Bridians are also masters (mistresses?) of their art. I've enthused for so long about CRL's other offering this week, that there's really not enough space left to do justice to this second parody, but that's not because it isn't as worthy of our attention. Again, it is a multi-parter (two parts in this case), but the location descriptions are generally not so loquacious as in *The Boggit*.

You don't have to know the original game in order to enjoy this one. There are many frustrating puzzles to be enjoyed and plenty of locations to be explored (there's even a Space Invaders Room, where you play the game in text!), and plenty of objects to pick up. Some of these may be thrown at you though, unlike the original, it's not a bearded dwarf, but rather a ginger-haired dwarf. *The Quill* is used well, and *Patch* offers Ram saves as well as a few sound and visual effects. CRL are packaging these adventures well, and the quality is maintained even on the loading screens, which are very attractive.

I enjoyed playing *Very Big Cave* – it was almost like discovering the original afresh. Ah, the nostalgia of it all!



# "The envelope, please . . ."

**M**any thanks to everyone who entered the Tolkien competition in *Popular*, July 10. We guessed *Lord of the Rings* would be an attractive prize on the Amstrad PCWs, but it was interesting how much interest *The Hobbit* still generates.

Few people had much difficulty with the questions, but then they weren't intended to be too obscure.

As a checklist, the questions – and answers – were:

1 Bilbo and Frodo shared a birthday. What date was it? (Answer: September 22 – reference: page 1 of *LOR*)

2 Who was "an evil thing in spider form", from whom no fly escaped? (Answer: Shelob – reference: page 751 of *LOR*)

3 In *The Hobbit*, what was the name of the dragon who had stolen Thorin's family's treasure? (Answer: Smaug – reference: page 33 of *The Hobbit*)

4 Under what name did Frodo, Pippin and Merry first meet Aragorn, son of Arathorn? (Answer: Strider – reference: page 182 of *Lord of the Rings*)

5 What did Bilbo Baggins intend to call his memoirs? (Answer: There and Back

Again: *A Hobbit's Holiday* – reference: page 284 of *The Hobbit*)

First out of the hat and the winner of the special Melbourne House hologram as well as the game was Roy Stead, of Widnes in Cheshire. Congratulations, Roy.

The nine runners-up were: Christopher Best of Plymouth; Alan Brown of Coventry; G C Burns of Gateshead, Tyne and Wear; Rhys Clement-Evans of Woolton, Liverpool; R Costen of Tunbridge Wells; Tim McElwaine of Crowthorne, Berkshire; C A Mitchell of Stafford; Colin Read of Pewsey, Wiltshire; and Geoffrey C R Williams of Birmingham.

## Name that PSS sequel

**L**ast month we invited you to name the follow-up game to PSS's *Swords & Sorcery*.

Apart from the nameless dodo who suggested *Swords & Sorcery II*, most of you attempted to be original and after

much pondering PSS has come up with the winner.

He is Jason Boydell, of Bolton, Lancs, who will get a credit on the final packaging for the game – now to be called *Heroquest*.

Free copies of the game will be going to the runners-up, who are:

D Mitchell, of Southampton; Keith Wolstenholme, of Manchester; Neil Belfitt, of Worksop, Notts; P Shaw, of Blackpool, Lancs; D Orme, of Tipton, W Midlands; C T Harper, of West Bromwich; S A Savage of E Grinstead, Sussex; R T Blazye, of Hayes, Kent; Gavin Lennon, of Newtown Butten, Co Fermanagh; Robert Donnan, of Swansea; Roger Brittain, of Bournemouth; K Earley, of East Croydon, Surrey; Alan Jackson, of Olney, Bucks; R Tugwell, of Northampton; Andrew Sufin, of Blandford Camp, Dorset; Paul Wright, of Skelmersdale, Lancs; Tommy Tornari, of London N13; Stephen Richards, of Blairgowrie, Tayside; D M Shannon, of Newtown Abbey, Co Antrim; C T Eng, of London SW11; Alistair Lam, of Belfast; S McCarthy, of Newark, Notts; Hans Demmicks, of Berlin; and Ian Grisby, of Colchester, Essex.

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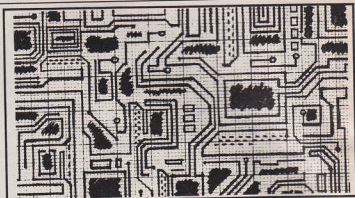
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For example, *Print Rom\$(1986)* give the output MCMLXXXVI.



21-27 AUGUST 1986



## Space War

by Mark Ward

This week features the final part of Space War. The remainder of the instructions are as follows:

Mines (column 6 table (1))

Bombers can lay mines on the board (symbolised by an M). Any ship landing on top of a mine square at the end of its go will be destroyed. A bomber can lay a

their turn on a mine square are not destroyed. They carry special equipment that deactivates the minefield for the rest of the game.

Long Range Scanners (LRS) (column 8 table (1))

As the battle first starts all enemy ships are unidentified (symbolised by an E).

Moving any ship with long range scan-

higher energy value will beat one with a lower value when the two are involved in a battle. The two exceptions to this rule are:—








1) a scout will beat an HQ ship

2) a scout will beat an HB ship

Battle is initiated when a ship finishes its go in the same square as a ship of the enemy fleet.

Oh yes, one thing I forgot to mention.

TABLE (1)

SHIP	SYMBOL	MOVE	HYPER-SPACE	HYPER (%)	MINES	DREDGER	L.R.S.	ENERGY
H.Q. Ship		3	2	2	No	Yes	Yes	7
Heavy Battle Ship		7	4	2	No	No	No	6
Light Battle Ship		3	-	-	No	No	No	5
Bomber		4	-	-	Yes	No	No	4
Cruiser		3	-	-	No	No	No	3
Dredger		4	-	-	No	Yes	No	2
Scout		7	7	2	No	No	Yes	1

mine on any square that it could reach during a normal movement go.

You only have a few mines so use them sparingly. Once they are gone there are no more.

Controls—The M key lays a mine.

Dredger (column 7 table (1))

Ships with dredger capabilities that finish

ners next to an enemy ship will identify the enemy. The long range scanners will not work if it is the enemy who moves next to you! Ships are also identified once they have been involved in a battle.

Energy (column 9 table (1))

The energy value gives the effectiveness of a ship in battle. Generally a ship with a

The enemy has already mined the battle-field with mines "invisible" to your scanners. Good luck.

And finally, if you don't want to type it all in send £3 to Mark Ward at 43 Wordsworth Road, Hampton, Middlesex for a copy on cassette.

<pre> 2290F0RnX=1T01000:NEXT 2300NEXT:NEXT 2310G0C0L3,1 2320shX(e1X)=0 2330IFshX(31shX+shX-1):MOVE930,90:PRINT# HX+1:MOVE930,90:PRINTshX 2340IFshX(31shX+shX-1):MOVE930,50:PR INT#shX+1:MOVE930,50:PRINT#shX 2350psX(e1X)=1 2360ENDPROC 2370DEFPROCend(a2#) 2380VDU4:VDU28,12,17,27,12:CLS 2390*FX21,0 2400PRINTTAB(3,2)"You "a2#:INPUTTAB(0, 4)"Another go(Y/N)",I# 2410IFI#="Y":RUN ELSEEND 2420ENDPROC 2440DEFPROCinit 2450L#=""shX+30:e_shX=30:WX=4 2460F0RnX=1T07:READY#(nX):NEXT 2470F0RnX=1T060:READshX(nX):NEXT 2480F0RnX=1T04:READobX(nX):NEXT </pre>	<pre> 2490F0RnX=31T060:shX(nX)=-shX(nX):NEXT 2500PROCrrnd 2510F0RnX=1T030 2520READpsX(nX) 2530F0RnX=0T04 2540IF(psX(nX)-mX)MOD31=0psX(nX)=psX(nX) +30:(12*mX) 2550NEXT:NEXT 2560PROCrrnd 2570F0RnX=31T060:READpsX(nX):NEXT 2580ENDPROC 2590DEFPROCrrnd 2600stX=RD(4) 2610IFstX=1RESTORE3040 2620IFstX=2RESTORE3050 2630IFstX=3RESTORE3060 2640IFstX=4RESTORE3070 2650ENDPROC 2660DEFPROCscr 2670G0C0L1:VDU5 2680F0RnX=20T01260STEP40:MOVE#nX,140:PLO TS,nX,1020:NEXT </pre>	<pre> 2690F0RnX=140T01020STEP40:MOVE20,nX:PLO TS,1260,nX:NEXT 2700F0RnX=1T060 2710MOVEF0RnX(nX),F0RnX(nX):T#ty#(ABshX(1 nX)) 2720IFnX(31G0C0L3,3ELSEG0C0L3,2 2730PRINTNap(T#,nX) 2740NEXT 2750G0C0L0,3 2760MOVE20,130:PRINT"SHIP":MOVE20,90:PR INT"ENERGY":MOVE20,50:PRINT"L.R.S":MOVES 00,130:PRINT"MOVE" 2770MOVE500,90:PRINT"H/SPACE":MOVE500,5 0:PRINT"H/S(X)":MOVE880,90:PRINT"SHIPS": MOVE880,50:PRINT"E/SHIPS" 2780MOVE590,610:VDU240,241,8,8,10,242,2 43 2790F0RnX=1T014 2800m1X(nX)=RD(682) 2810F0RnX=1T02 2820IF(e1X(nX)+mX)MOD31=0nX=nX-1:nX=2 2830NEXT:NEXT </pre>
--	---	--

```
2840LY=14
2850GCOL3,1:MOVE930,90:PRINTshX:MOVE930
,50:PRINTe_shX
2860PROCmet
2870ENDPROC
2880DEFNnX(nX)=psX(nX)MOD31*40+24
2890DEFNny(nX)=psX(nX)DIV31*40+174
2900DEFNsp(tX,nX)
2910IFshX(nX)>95%:16ELSESX:=1
2920IFnX>30:enemX:=8ELSEenemX:=0
2930=CHR$(127+enemX+VAL(MID$(tX,SX,1)))
2940DATA*8SCOUT 7720011"
2950DATA*8REDGER 4000102"
```

```
2960DATA*8CRUISER 3000003"
2970DATA*8BOMBER 4001004"
2980DATA*8L.B.SHIP3000005"
2990DATA*8H.B.SHIP7420006"
3000DATA*8Q.SHIP 3220117"
3010DATA3,5,6,3,5,4,6,5,7,7,5,6,4,5,3,6
,5,3,2,1,2,6,1,4,4,1,6,2,1,2
3020DATA6,5,1,5,6,5,6,7,6,7,5,6,7,1,5,6
,7,1,3,6,1,3,3,3,3,1,6,3,1,5
3030DATA324,325,355,356
3040DATA0,31,62,93,124,136,248,279,310,
341,372,403,465,527,558,589,620,651,32,9
4,125,187,280,311,342,373,466,528,559,62
```

```
1
3050DATA0,31,62,93,155,186,217,248,403,
434,465,496,558,589,620,651,32,63,94,156
,187,218,249,404,435,466,497,559,590,621
3060DATA0,1,2,3,4,31,32,33,34,62,63,64,
93,94,124,651,652,653,654,655,620,621,62
2,623,589,590,591,558,559,527
3070DATA0,32,64,96,128,158,188,218,248,
403,435,467,499,531,561,591,621,651,279,
280,281,310,311,312,341,342,343,372,373,
374
>
```

## Programming: C64

### Screen Scroller

by David Shaw

**T**his routine gives the Basic programmer what was previously unobtainable, scrolling in any of four directions, one character at a time. As the routine does not interfere with Basic

memory it can be incorporated easily into your own programs.

Applications for this program range from games to pseudo 80 column word processing.

Once the routine has been initialised

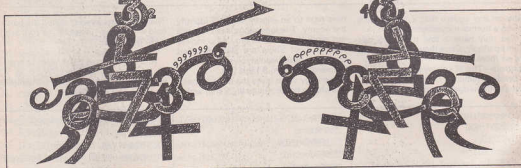
use the following Sys calls.

Sys 49152 to scroll the screen upwards.

Sys 49232 to scroll downwards.

Sys 49312 to scroll leftwards.

Sys 49363 to scroll rightwards.



```
1 REM *****
2 REM *SCREEN SCROLLER*
3 REM * BY *
4 REM * DAVE SHAW *
5 REM * WOKINGHAM *
6 REM *****
11 FORT=0T0294:READA:POKE49152+T,A:NEXT
12 DATA 162,0,160,0,185,40,4,153,0,4,200
13 DATA 192,40,208,245,232,224,24,208,29
14 DATA 169,4,141,6,192,141,9,192,169,40
15 DATA 141,5,192,169,0,141,8,192,169,32
16 DATA 162,40,157,191,7,202,208,250,96
17 DATA 173,5,192,24,105,40,141,5,192,144
18 DATA 3,238,6,192,173,8,192,24,105,40
19 DATA 141,8,192,144,3,238,9,192,76,2,192
20 DATA 162,0,160,0,185,152,7,153,192,7
21 DATA 208,192,40,208,245,232,224,24,208
22 DATA 29,169,7,141,86,192,141,89,192,169
23 DATA 152,141,85,192,169,192,141,88,192
```

```
24 DATA 169,32,162,40,157,255,3,202,208
25 DATA 250,96,173,85,192,56,233,40,141
26 DATA 85,192,176,3,206,86,192,173,88,192
27 DATA 56,233,40,141,88,192,176,3,206,89
28 DATA 192,76,82,192,162,0,169,4,133,252
29 DATA 138,133,251,160,1,177,251,136,145
30 DATA 251,200,200,192,40,208,245,165,251
31 DATA 24,105,40,133,251,144,2,230,252
32 DATA 232,224,25,208,227,169,39,141,4
33 DATA 193,169,4,141,8,193,76,3,193,162
34 DATA 0,169,4,133,252,138,133,251,160
35 DATA 38,177,251,200,145,251,136,136,192
36 DATA 255,208,245,165,251,141,105,40,133
37 DATA 251,144,2,230,252,232,224,25,208
38 DATA 227,169,0,141,4,193,169,4,141,8
39 DATA 193,169,0,133,251,169,4,133,252
40 DATA 160,0,162,0,169,32,145,251,232,224
41 DATA 25,240,14,165,251,24,105,40,133
42 DATA 251,144,238,230,252,76,15,193,96
```

## UXB by Ian Grainger

This is the third and final part of UXB, the arcade style game. The game is available for £2 if

you haven't been typing the listing in. Send your money to Ian Grainger, 33 Wellfield Road, Co Durham TS28 5LA.

```
5899 REM Reduce time
5900 PRINT AT 17,10; INK 2; PAPER 2; "
: LET tim=tim-1
5910 IF tim<6 THEN LET lost=1: RETURN
5920 RETURN
5999 REM Set skulls, flags and bomb
6010 FOR f=1 TO 5
6015 LET x1=INT (RND*16)+1: LET y1=INT (
RND*8)+1
6020 IF b(x1,y1)=1 THEN LET b(x1,y1)=2:
PRINT AT (y1-1)*2,(x1-1)*2: INK 4:
: "AT (y1-1)*2+1,(x1-1)*2: " : NEXT f:
GO TO 6040
6030 GO TO 6015
6040 FOR f=1 TO INT (10+(10/3))
6045 LET x1=INT (RND*16)+1: LET y1=INT (
RND*8)+1
6050 IF b(x1,y1)=1 THEN LET b(x1,y1)=3:
PRINT AT (y1-1)*2,(x1-1)*2: INK 7:
: "AT (y1-1)*2+1,(x1-1)*2: " : NEXT f:
GO TO 6070
6060 GO TO 6045
6070 LET x1=INT (RND*16)+1: LET y1=INT (
RND*8)+1
6080 IF b(x1,y1)<1 THEN GO TO 6070
6090 LET b(x1,y1)=5: PRINT AT (y1-1)*2,(
x1-1)*2: INK 6: " : "AT (y1-1)*2+1,(x1-
1)*2: "
6100 RETURN
6109 REM Congratulations- The End
6110 RANDOMIZE USR 64200
6120 LET a$="CONGRATULATIONS!"
6130 FOR f=1 TO LEN a$: FOR i=1 TO 7: PR
INT AT 0.8*(f-1); INK i:a$(f): BEEP .001
.40: NEXT i: BEEP .1:60: NEXT f
6140 PRINT AT 3,0: INK 5:"That was absol
utely magnificent!": BEEP .1,10
6150 PRINT AT 5,0: INK 6:"Bet you never
thought you would": BEEP .1,10
6160 PRINT AT 7,12: INK 7:"DO IT.": BEEP
.1,10
6169 REM Little Ditty
6170 DATA .4,0,.4,2,.4,4,.8,5,.8,4,.8,3,
.8,2,.8,1,.2,9,.5,7,.8,5
6180 RESTORE 6170: FOR n=1 TO 11: READ a
, b: FOR f=1 TO (a*30)/2: BEEP .01,b: BEE
P .01,b+12: NEXT f: NEXT n
6190 FLASH 1: LET p=6: LET p1=0: LET i=1
: LET i1=7: LET x=0: LET y=20: LET a$="C
ant wait ? Press a key to go on": GO SUB
9000: FLASH 0
6200 IF INKEY$="" THEN GO TO 6200
6210 GO TO 500
6998 STOP
6999 REM work out where you are
7000 IF x1<16 THEN LET x1=1
7010 IF x1<1 THEN LET x1=16
7020 IF y1>8 THEN LET y1=1
```

```
7130 IF y1<1 THEN LET y1=8
7040 IF b(x1,y1)=0 THEN GO TO 7090
7050 PRINT AT (y1-1)*2,(x1-1)*2: INK 5:
: "AT (y1-1)*2+1,(x1-1)*2: " : LET x=x1: L
ET y=y1
7060 IF b(x,y)=3 OR b(x,y)=4 THEN LET 1
ost=1: GO TO 7090
7070 IF b(x,y)=2 THEN FOR f=1 TO 3: BEE
P .01,0: BEEP .01,6: NEXT f: LET sc=sc+1
60: GO SUB 5640
7080 IF b(x,y)=5 THEN FOR f=1 TO 3: BEE
P .01,12: BEEP .01,6: NEXT f: LET sc=sc+
250: LET bo=bo-1: GO SUB 5030: IF bo<0 T
HEN GO SUB 6070
7090 RETURN
7499 REM Worm movement
7500 IF wx<16 THEN GO SUB 7590: LET wx=
15: GO TO 7580
7501 IF wx<X AND b(wx+1,wy)<2 THEN GO S
UB 7590: LET wx=wx+1: GO TO 7580
7509 IF wx<1 THEN GO SUB 7590: LET wx=2
: GO TO 7580
7510 IF wx>X AND b(wx-1,wy)<2 THEN GO S
UB 7590: LET wx=wx-1: GO TO 7580
7519 IF wy=8 THEN GO SUB 7590: LET wy=7
: GO TO 7580
7520 IF wy<Y AND b(wx,wy+1)<2 THEN GO S
UB 7590: LET wy=wy+1: GO TO 7580
7529 IF wy=1 THEN GO SUB 7590: LET wy=2
: GO TO 7580
7530 IF wy>Y AND b(wx,wy-1)<2 THEN GO S
UB 7590: LET wy=wy-1: GO TO 7580
7539 IF wy=8 THEN GO SUB 7590: LET wy=7
: GO TO 7580
7540 IF b(wx,wy+1)<2 THEN GO SUB 7590:
LET wy=wy+1: GO TO 7580
7549 IF wy=1 THEN GO SUB 7590: LET wy=2
: GO TO 7580
7550 IF b(wx,wy-1)<2 THEN GO SUB 7590:
LET wy=wy-1: GO TO 7580
7559 IF wx=16 THEN GO SUB 7590: LET wx=
15: GO TO 7580
7560 IF b(wx+1,wy)<2 THEN GO SUB 7590:
LET wx=wx+1: GO TO 7580
7569 IF wx=1 THEN GO SUB 7590: LET wx=2
: GO TO 7580
7570 IF b(wx-1,wy)<2 THEN GO SUB 7590:
LET wx=wx-1: GO TO 7580
7580 BEEP .01,-3: RETURN
7590 LET b(wx,wy)=1
7600 PRINT AT (wy-1)*2,(wx-1)*2: PAPER 1
: INK 6: " : "AT (wy-1)*2+1,(wx-1)*2: "
: RETURN
7999 REM Life lost
8000 LET l1=l1-1
8010 PRINT AT (y-1)*2,(x-1)*2: INK 6:"%
: "AT (y-1)*2+1,(x-1)*2:"%
8020 GO SUB 4030
```

```
8030 GO SUB 5020
8040 RETURN
8999 REM position worm
8990 LET wx=INT (RND*14)+2: LET wy=INT (
RND*6)+2: IF b(wx,wy)<1 THEN GO TO 8990
8910 PRINT AT (wy-1)*2,(wx-1)*2: INK 3:
: "AT (wy-1)*2+1,(wx-1)*2:"%
8915 LET b(wx,wy)=4
8916 IF wx=X AND wy=Y THEN LET lost=2
8920 RETURN
8990 STOP
9000 REM Print routine
9010 PAPER 0: INK 1: PRINT AT y,x: FOR f
=1 TO LEN a$: PRINT a$(f): BEEP .01,9:
NEXT f: PAPER 1: INK 1: RETURN
9019 REM Flag up
9020 FOR f=16 TO hi STEP -1
9030 PRINT AT f,10: INK i: " : "A
T f+1,10: PAPER 1: INK 7: " : "h$(i): " : "A
T f+2,10: INK i: " : "AT f+3,10:
PAPER 6: "
9040 NEXT f: PRINT AT hi-2,10:hi(1): RETU
RN
9499 REM Flag tune
9500 DATA .5,5,1,-999,5,5,1,-999,.25,
5,1,-999,5,7,.5,5,5,3,5,2,75,3,.25,
0,5,-2,4,-999,75,-3,75,-2,75,0
9510 DATA .5,5,1,-999,5,5,1,-999,.25,
5,1,-999,5,7,.5,5,5,3,5,2,75,3,.25,
0,5,-2,4,-999,75,-3,75,-2,75,0
9520 DATA .25,5,1,-999,5,5,1,-999,5,
5,1,-999,5,2,.25,0,5,-2,5,0
9530 DATA .25,5,1,-999,5,5,1,-999,5,
5,1,-999,5,2,.25,0,5,-2
9540 DATA .4,-999,25,5,1,-999,5,5,1,-
999,5,5,1,-999,25,2,25,0,25,-2
9550 DATA 1,-999,25,-2,1,-999,25,-2,
5,0,5,-2,1,-999,75,-2,4,-999,25,5,
.25,-2,25,2,25,7,25,5,3,-999,75,5,
4,-999,25,5,1,-999
9560 DATA .5,5,1,-999,5,5,1,-999,5,2
,25,0,5,-2,5,0,2,-999,25,5,1,-999,
.5,5,1,-999,5,5,1,-999
9570 DATA .5,2,25,0,5,-2,4,-999,25,5
,1,-999,5,5,1,-999,5,5,1,-999,5,2,
.25,0,25,-2
9580 DATA 1,-999,25,-2,1,-999,25,-2,
5,0,5,-2,1,-999,1,-2,10,-999,1,-1
9600 RESTORE 9500: FOR n=1 TO 120: READ
a,b
9605 IF a=-1 THEN GO TO 9600
9610 IF b=-999 THEN PAUSE (a*30)/2: GO
TO 9630
9620 FOR f=1 TO (a*30)/2: BEEP .01,b: BE
EP .01,b+12: NEXT f
9625 IF INKEY$="" THEN RANDOMIZE USR 6
4200: RETURN
9630 NEXT n
```

## Memory Check

by Robert Davis

The following routine on the QL will, when called by typing *mem check*, print on screen the number of bytes used by your program and the number of free bytes left.

The routine itself can be added on to the end of a program under development and called periodically to check on the available free memory.

```

9000 DEFine PROCedure mem_check
9010 CLS
9020 LET bytes_used=PEEK_L(163860)-PEEK_L(163856)-4096
9030 REMark IF QL with more the 128k
9040 REMark then change the 128.
9050 LET bytes_left=(128*1024)-bytes_used
9060 CSIZE 3,0:INK 4:CLS#0
9070 PRINT"Bytes used : ";bytes_used
9080 PRINT"Bytes left : ";bytes_left
9090 END DEFine mem_check
    
```

## Filler

by M Ulyatt

This procedure for the BBC caused by *Proc fill (xp%,yp%,c%)*, performs a basic filling function. The co-ordinates of the starting point for the fill are xp% (horizontal) and yp% (vertical) with the colour used being c%.

It should be noted that only black backgrounds will be filled in and that the routine will stop filling in whichever direction it was progressing at the time, on encountering a non-black pixel.

```

9000DEFPROCfill11(xp%,yp%,c1%)
9010AX=yp%:GCOLOR,c1%
9020IFPOINT(xp%,AX)<>0GOTO9050
9030PLOT77,xp%,AX
9040AX=AX-4:GOTO9020
9050AX=yp%+4
9060IFPOINT(xp%,AX)<>0 ENDPROC
9070PLOT77,xp%,AX
9080AX=AX+4:GOTO9060
    
```

## Tape Directory

by S Mitchell

The purpose of this program for the Vic 20 is to print a directory of programs stored on a particular cassette using an MPS 801 dot matrix printer.

To print the directory, ensure that the printer is switched on first, then insert your tape and start the tape recorder. Program titles will then be displayed on the screen and printed, although titles containing Vic graphics symbols are not guaranteed to be displayed correctly.

The program has no method of detecting the end of the tape so the user must press the Stop/Restore button.

```

2 POKE36879,110:PRINT"SS":
  FORT=716807168+13:READA:POKET,A:NEXT
3 DATA162,0,189,65,3,157,0,30,232,224,16,
  288,245,96
4 OPEN1,1:CLOSE1:SYS7168
5 FORT=76807695:POKET,PEEK(T)+64#
  (PEEK(T)+64):NEXT
6 AS="" :FORT=76807695:Z=PEEK(T)
7 IFZ>31THENAS=AS+CHR$(Z):GOTO9
8 AS=AS+CHR$(Z+64)
9 NEXT:OPEN4,4:PRINT#4,AS:CLOSE4:RUN
    
```

## We want your programs!!

**Y**es, this is your chance to get rich and famous. Well, famous anyway, as *Popular Computing Weekly* is looking for contributions to the Programming pages.

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With Kenn Garroch

## Non-Plussed 1

Edward Barnett of Leavesdon, near Watford writes:

**Q** Is there such a thing as a Plus 1 interface built into the Acorn Electron, or is it an add on extra? I bought a game the other week and it says, "Some of these games will not load because of the Plus 1 interface, if you have difficulties, disconnect the Plus 1". I have not had any difficulties and all of the games load so, could you describe where and what the Plus 1 is?

**A** When the Electron was brought out, it was part of the BBC micro family, but did not have the many interfaces of the older machine. The Plus 1 was an add-on brought out by Acorn to try to correct this. It consisted of a box that clipped on to the back of the Electron and provided the machine with an analogue joystick interface, a cartridge socket and a centronics printer port.

Later on, Acorn brought out the Plus 3, a 3.5 inch disc interface and drive.

## Sys significance

S Singh writes:

**Q** I own a CBM 64 and am writing a game. As you know, Basic is not very fast so, I would like to use the Sys command. I know that to use the Sys command you have to Poke numbers into the memory and call up these with a Sys.

I want to know what each number stands for and what they do.

**A** At the heart of the C64 is a microprocessor known as a 6502 which, by itself, cannot understand Basic commands. What it does understand are numeric codes (op codes) that tell it to do very simple things such as moving a value from one place to another, adding, subtracting, etc. This is machine code (the numbers you poke into memory and call with Sys are the same). By grouping these codes into sections, the machine can be made to perform more complex operations such as reading the keyboard, printing to the screen, and understanding and performing Basic commands.

Using a manual for the 6502, it is possible to create machine code programs by looking up the various commands, finding their numbers and poking them into memory. This, however, is a very tedious process and is a job usually handled by a program called an assembler.

Here, each code is given a mnemonic name, eg LDA loads something into the accumulator (a place inside the microprocessor where numbers can be operated on). STA stores the contents of the accumulator in memory. Using mnemonics, it is much easier to write programs since they are more easily read, and all the work of turning them into numbers is left to the assembler.

Once a section of code has been assembled, it can be loaded into the memory and, from Basic, a Sys call can be made to its start address to execute it. So, to write your game, in machine code, you will need a book on the 6502, preferably when used in conjunction with the C64, and an assembler.

The best books to go for are Rodney Zaks' *Programming the 6502*, and First Publishing's *Anatomy of the 64*.

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Kenn Garroch and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke*, PCW, 12-13 Little Newport Street, London WC2R 3LD

## The Hex hex

A Heitman of St Leonards on Sea, writes:

**Q** I have a Spectrum 128K, and my problem is that any article about computers and the 128K begins "ABCF" hex or "FFFF" hex. I can figure FF=255 but any further seems beyond me. Is there a table anywhere? If not, is there a program which converts from hex to normal figuring? Is there an arithmetic solution?

**A** Hex is not the curse that some people seem to think it is, it's simply a way of representing numbers that is more convenient for use with computers. Normal figuring, is done to base ten which means that when you reach nine, the next number is two digits, the one representing 1\*10 and the zero representing 0\*1. This becomes a little clearer if you take a number like 123 (decimal). The value is one times one hundred, plus two times ten plus three times one.

Taking the columns from right to left, the first is the ones, the second the tens, the third, hundreds. More arithmetically, these are (right to left) 10<sup>0</sup>, 10<sup>1</sup>, 10<sup>2</sup>, 10<sup>3</sup>, etc (10 to the power of 0 is 1 and ten to the power of 1 is ten and ten to the power of 2 is one hundred and so forth). So 324 is (4\*10<sup>0</sup>) + (2\*10<sup>1</sup>) + (3\*10<sup>2</sup>).

Extending this to hexadecimal where the base is 16, the columns from right to left will be 16<sup>0</sup>, 16<sup>1</sup>, 16<sup>2</sup>, 16<sup>3</sup>. Also, since the second column starts at 16 (16 to the power of 1 is sixteen), it is necessary to count 16 ones to reach it. In base ten, the figures 0-9 are used before reaching 10. In base 16, we add A,B,C,D,E,F after nine to give 16 digits. This may sound awfully complex but converting between hex and decimal is quite easy.

Take the first column and change it to a decimal number, so 0-9 stay as they are, A-F become 10-15. Do the same with the second, third, and succeeding columns, then multiply these values by 16 to the power of the column number (the rightmost column is numbered zero) and add them together, eg:

ABCF becomes 10, 11, 12, 15, then:  
(10\*16<sup>3</sup>) + (11\*16<sup>2</sup>) + (12\*16<sup>1</sup>) + (15\*16<sup>0</sup>), which is:  
(10\*4096) + (11\*256) + (12\*16) + (15\*1), which comes to 43983 in decimal.

To go the other way (from decimal to hex) is a little more difficult; the simplest method is the double dabble method which can be used for any base (for binary just divide by two instead of 16).

Take the number to be converted to hex (43983 seems like a good choice) and divide by 16. The result can be taken as two parts, the remainder, and the whole number of times 16 went into 43983 (the quotient). Write down the remainder (found by removing the decimal part of the result and multiplying the resulting integer by 16, then subtract from the original, if you are using a calculator).

With our example, this is:  
43983 / 16 = 2748.9375  
(16\*2748=43968 and 43983-43968=15) or 2748 remainder 15.

Take the quotient (2748) and perform the same operation:

2748/16=171 remainder 12

Take the quotient (171) and do it again:

171/16=10 remainder 11

The quotient is now less than 16 so this is taken as the last remainder (10) and the conversion is almost complete. Take all the remainders in the order they were found: 15, 12, 11, 10 and reverse the order: 10, 11, 12, 15. Then, if any are greater than 9, substitute the appropriate hex letters (10=A 11=B 12=C 13=D 14=E 15=F) and there is the result: ABCF.

The reason for using hexadecimal is that each digit of a hex number can be represented by four binary digits (0000-1111 is 0-F) so converting from hex to binary and vice versa is simplicity itself: 0100101100011000=4B18.



## Adventuring via the modem – it's a Mug's game

*David Wallin boldly goes into the world of the Gods and Shades, and wallows in MUD*

I'm sure everyone has heard of *MUD* by now. *MUD* stands for Multi-User Dungeon and was the first MUG (Multi-User Game) written. At this point I should mention that 99 percent of MUGs are adventures of some sort or other, and I'll only be dealing with adventures this week.

The original version of *MUD* was written on, and still resides on, Essex University's Dec-10 mini-computer. It was written in 1979 by an undergraduate called Roy Trubshaw. In 1980 it was updated and improved by Richard Bartle. This version is the version that both BT and Compunet now use.

Richard Bartle, Simon Dally and Roy Trubshaw decided to set up a company to market *MUD* and other MUGs, MUSE (Multi User Entertainment Ltd.), now have expanded versions of *MUD* planned as well as other MUGs on the way. The cost of BT *MUD* has recently been cut in a special offer, the starter pack costing only £4.95 now. Access charges have also been cut by 50 percent.

As with BBs you get company-run MUGs like BT *MUD*, and enthusiast run MUGs, like *Gods* and *Shades*. Both these will be reviewed in a few weeks in this column.

Most MUGs are very similar to normal adventure games; you get a description of the room you're in and you type a command. There are the usual *North*, *South*, *East*, *West*, *Get*, *Drop*, etc. commands and also commands like *Say*, *Give* or *Follow*, which allow inter-action with the other players. In a MUG, don't forget most of the other characters are human and so are intelligent and should react sensibly (though often they don't) to your actions.

When you log on to a MUG, you will need to choose a persona for your character. A persona is like a CB handle — mine is Communicator. You can choose a persona that reflects who you are or what you are like, or often, personae come from literature; Gandalf is a very common persona. There are no rules about choosing a persona, but they generally have the first word as short as possible (I'll explain why in a minute), and often funny, like Angelina the Dangerously Sane. You also have to choose the sex of the persona (on some MUGs, the spell 'change', will change the sex of a

character) and a password.

On *Gods*, you start as scum and must become a God. On *MUD*, to improve your level, you must collect treasure and take it to the swamp, and on *Gods* you must offer it to one of the Gods in his temple. On *MUD* when you become a wizard it is the end of that part of the game.

You can then start again, as with a normal adventure, but you'll now find you are very powerful and able to do many things, like killing people, giving them more points, spying on them, moving treasure, etc. On *Gods*, a God only stays a God while people provide him or her with treasure and so they can become mere mortals again.

In all MUGs you can talk to the other players. On *MUD* you can talk by typing: *Tell [name]* Tell the person [name] *[message]* the message *[message]*. Only [name] is told the message.

*Shout [message]* Shout *[message]* to all players.

*"[message]"* Tell everyone at your location the message *[message]*.

The reason for keeping the start of a persona short is because this is the name used in conversations and *Tell Dan Hello* is a lot quicker to type than *Tell wonderful Hello* (a persona might be wonderful Dan the insane).

Talking to other players can be useful. You can plot to kill another player who you all dislike, but beware, most MUGs let you have more than one persona, so persona abc and xyz could both belong to the same person. That means that if you talk to abc about killing xyz, abc is likely to kill you!

I have often found that when I log on to *Gods*, I stay in my Hotel Room (where you start) or one of the rooms just outside it for an hour or two just talking to people. I have listened to many conversations on pop music, hacking and communications, since conversations are often on subjects that Bulletin Boards would dedicate a Sig to.

MUGs are great fun to play. I often use *Gods* and I am usually on-line for at least an hour or two at a time. This does unfortunately incur a high phone bill. Different MUGs have different charging methods. BT *MUD* costs £4.95 (at the

moment) to register to and a certain amount per hour on-line. On *Gods* there is a one off charge of £23 and access time is not charged. *Shades* is totally free, except, of course, for the phone bill. MUGs can seriously damage your financial status. Play with care.

Why not give *Shades* and *Gods* a ring? If you have PSS then give Essex University *MUD* a ring as well.

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Richard Bartle – co-author of *MUD*



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## Sing a song with Amstrad

Mark Jenkins plays with some new packages

THE AMSTRAD CPC series is reasonably well served as far as music packages go, although the major instrument companies haven't picked up on the machines yet since they haven't penetrated much into Japan or the US.

As with other machines, such as the Commodore 64, music packages are divided between those for the built-in three-voice sound chip, those using add-on hardware, and those for Midi applications, so we'll look at these three fields in turn.

The Amstrad's sound chip isn't as powerful as the Commodore's SID chip, so software-only products have a hard time to improve. But *Minstrel* from Kuma Computers (£14.95 cassette, £19.95 disk) and *Music Box* from The Electric Studio (£9.95 cassette, £16.95 disk) are both good starting points for the inexperienced musician. *Rainbird's The Music System*, or *Advanced Music System* packages are superior although more expensive, and as on the BBC version seek to improve the Amstrad's sound by adding modulation generators and other effects in software.

*TMS/AMS* runs on the CPC 464/664/6128, and is available on disk only in the *AMS* version, which adds printer and linker options for longer composition. Basic operation is in the style of a tape machine with familiar fast forward/rewind and other controls, and there's a synthesiser page which allows you to create and save your own sounds as well as complete compositions. You can upgrade from *TMS* to the £29.95 *AMS* for £14 (from cassette) or £10 (from disc).

*TMS/AMS* is icon-based, which can be more of a hindrance than a help since some of the icons are a little obscure - I'd have preferred more labelling in English. There's no Midi on the Amstrad version either, but *TMS* certainly makes the best of what's available on-board.

*Music Master* from Vanguard Leisure is more approachable, and is an entry level music package which offers six instrumental sounds for any one of the three voices. The cursor keys are used to select which voice is recorded and left to play in the background and you can play

'live' from the computer keyboard over the top. The keyboard uses a window of three octaves at a time out of a total range of eight octaves, and you can add percussion effects by playing the keypad keys 4-9.

Compositions can be saved to tape or disc and the screen display of a piano keyboard shows which notes are being played at any time. There's no editing or synthesising facility but at £12.95 (cassette) or £15.95 (disc) the *Music Master* package is a good starter's guide to composition.

On the hardware front, Vanguard also markets *Maestro*, a package offering a small stereo amplifier, headphones, two 3-inch speakers and a music demo cassette which takes full advantage of the Amstrad's stereo sound output. *Music Master* and all the other on-board sound packages mentioned would probably benefit greatly from the addition of *Maestro*.

We've mentioned *AmDrum* before on these pages - it's the Amstrad version of *SpecDrum*, a small cartridge which replays sampled drum sounds and allows you to compose long patterns using them. It's available through Boots and manufactured by Cheetah Marketing, and gives two loading options for different sets of drum sounds. Two alternative kits - *Latin Kit* and *Editor* and *Electro Kit* and *Editor* - are also now available at £3.99 and £4.99 respectively. The editor section of the software allows you to combine sounds from different kits to create your own distinctive combination of drums.

Beats can be entered in real or step time, two sounds can be played simultaneously, and a composer page allows you to chain patterns into very lengthy compositions. Sample quality is on a par with £300 drum machines, so the *AmDrum* comes highly recommended. Incidentally, Cheetah publish a sheet on how to synchronise *AmDrum* to other musical instruments.

The only Midi package available for the Amstrad micros at the moment is *EMR's MidiTrack Performer*, which costs £129.95 for a tape and disc, and a Midi interface which works with the

464/664/6128 micros. Performer handles eight tracks of polyphonic Midi information entered in real or step time from a synth keyboard (Casio 02101 prices are now down to £175 second-hand), and you can bounce down a total of 29 tracks.

The single main display is operated using the cursor keys and space bar, although you can use a joystick to control tempo. Save, Load, Delete, File Name, Clear, Text, Arrange and Time Correct functions are all available on the right of the screen, the last of these referring to Performer's ability to tidy a sloppy keyboard performance to a variable degree.

Metronome, variable Count-In, variable Clock, Time Signature and Bar Length are all available and you can "punch in" to start recording at any bar, then chain up to 64 sections for compositions up to 20 minutes long. Total capacity is around 8,000 notes. We hope to look at some other Amstrad Midi packages in the near future.

If you have any queries or tips for this column, please write to Mark Jenkins at *Popular Computing Weekly*, 12-13 Little Newport Street, London WC2H 7PP. Mark would also welcome examples of your own music on audio or program tape, or disc.

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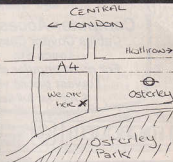
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**MEMOTECH** New Ward ROM-board, £28. Speculator ROMpak + software, £30. Also lots of MTX software. All boxed and in excellent condition. Telephone for details: 02554 37184. Ask for Pte-venning.

**AMSTRAD CPC464** with colour monitor, joystick, light pen, software etc, good condition. Only £165 o.n.o. Clacton (0256) 814523.

**BARGAIN** Sharp M280A, mint condition, original packing, built-in VDU and recorder, ideal for school project, software and books. All £195 o.n.o. Tel: (Vernon) 0205 750223.

**COMMODORE 64**, Two recorders £130, 1541 drive £105, £200+ tape software, 50+ discs, books, mags. Worth £900+, sell for £350 o.n.o. Tel: (Richard) 051-733 0090.

**TATUNG EINSTEIN** with original packing and manuals (includes disks and some software) £125. Tel: (Bill) 01-572 2917.

**MSX SONY** data recorder, joystick, £400 worth of software, manuals, leads, books, magazines, all boxed and as new, £150 o.n.o. Tel: 0222 397267.

**SPECTRUM** with Elite keyboard com/com programmable interface, about 50 original games, £130. Tel: Uxbridge 35955.

John Cook looks through this week's new arrivals

## Amstrad CPCs

**Program Johnny Reb II Type** Strategy **Micro** Amstrad CPCs **Price** £9.95 tape, £12.95 disc **Supplier** Lothlorion, Argus Press Software, Victory House, Leicester Place, London WC2 7NB.

**Program Music Box Type** Whilby **Micro** Amstrad CPCs **Price** £12.95 **Supplier** Melbourne House, 60 High Street, Hampton Wick, Kingston-Upon-Thames, Surrey.

**Program Magic Maths Type** Educational **Micro** Amstrad CPCs **Price** £1.99 **Supplier** Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

**Program Big Top Barney Type** Arcade **Micro** Amstrad CPCs **Price** £1.99 **Supplier** Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

**Program International Karate Type** Arcade **Micro** Amstrad CPCs **Price** £7.95 tape, £12.95 disc **Supplier** Endurance Games, 23-25 Castlecreagh Street, London W1.

**Program Speed King Type** Arcade **Micro** Amstrad CPCs **Price** £1.99 **Supplier** 8-10 Paul Street, London EC2.

**Program Space Shuttle Type** Simulation **Micro** Amstrad CPCs **Price** £9.99 tape, £14.99 disc **Supplier** Activation, 23 Pond Street, London NW3.

**Program Mission Omega Type** Strategy **Micro** Amstrad CPC **Price** £9.95 (tape) £12.95 (disc) **Supplier** Mind Games, Argus Press Software, Victory House, Leicester Place, London WC2.

**M**ind Games seems to be in the business of developing detailed, if somewhat graphically dull, strategy programs and the appearance of *Mission Omega* confirms this suspicion.

The game has you con-

structing and controlling a team of robots with the aim of shutting down four reactors aboard a 'mysterious object' that is rapidly approaching the Earth. All this activity is fully icon controlled (via cursor or joystick) and is certain to appeal to Mind Games' fans in that the brain must be fully engaged before you start - but I can't help thinking that it's not going to win any new converts to the MG cause.

## Amstrad PCWs

**Program First Base Type** Utility **Micro** Amstrad PCWs **Price** £29.95 **Supplier** Minerva Systems, 69 Sidwell Street, Exeter EX4 6PH.

**Program Learn Loco Type** Educational **Micro** Amstrad PCWs **Price** £16.95 **Supplier** Minerva Systems, 69 Sidwell Street, Exeter EX4 6PH.

## Atari ST

**Program Pro Fortran 77 Type** Utility **Micro** Atari ST **Price** £129 + VAT **Supplier** Prospero Software, 190 Castelnau, London SW13 9DH.

**Program Pro Pascal Type** Utility **Micro** Atari ST **Price** £129 + VAT **Supplier** Prospero Software, 190 Castelnau, London SW13 9DH.

**Program K-Speed Type** Utility **Micro** Atari ST **Price** £49.95 **Supplier** Kuma Computers, 12 Horseshoe Park, Pangbourne, Berks RG8 7JW.

**Program K-Graph Type** Utility **Micro** Atari ST **Price** £39.95 **Supplier** Kuma Computers, 12 Horseshoe Park, Pangbourne, Berks RG8 7JW.

## Atari

**Program Sunstar Type** Arcade **Micro** Atari XE/XL **Price** £9.95 tape, £14.95 disc **Supplier** CRL, 9 Kings Yard, Carpenter's Road, London E15 2HD.

Pick of the week

## Mad about Marbles

**Program Marble Madness Type** Arcade **Micro** Commodore Amiga **Price** £29.95 **Supplier** Ariolasoft, 68 Long Acre, Covent Garden, London WC2.

**A**bout 9 months ago, a new sub-class of arcade game came on to the home computer market, starting with Melbourne House's *Gyroscope*. You remember - the 'move the rolling object over the undulating, scrolling landscape avoiding the obstacles to the final goal within a time limit my goodness this reminds me of *Marble Madness*' type of game.

To be fair, titles such as *Spindizzy*, have taken the original *Marble Madness* concept and extended it considerably - but now (if you are rich enough to have an Amiga) you can cast aside imitations and derivations alike and experience the real thing that had all headbangers running for the arcades in their thousands.

*Marble Madness* on the

Amiga is great. Electronic Arts has made an exact copy of the coin-op original, complete with outstanding graphics, super smooth scrolling and fabby sound. It lovingly recreates all six levels (practice, beginner, intermediate, ariel, silly and ultimate), which - when you finish - (I'm working on it) you do backwards, then upside down... then the landscape starts going invisible... eek!

Suffice to say, with seven difficulty levels, choice of controls (mouse, trackball, joystick) and one or two player options, this is a game that you will keep coming back to time and time again. On very rare occasions, the marble does flicker just ever so slightly and you do have to wait for each level to be loaded as you complete it, but it makes no difference. *Marble Madness* has set a whole new standard for coin-op conversions to home micros. Out now for the Amiga and should be available on the 64 before Christmas. Start saving.

**Program Ghostbusters Type** Arcade **Micro** Atari 800 **Price** £9.99 **Supplier** Activation, 23 Pond Street, London NW3.

**Program Thrust Type** Arcade **Micro** Atari XL/XE **Price** £1.99 **Supplier** Firebird, 74 New Oxford Street, London WC1.

**H**aving decided that a BBC conversion of *Thrust* wasn't worth their while, Firebird have

come up with the goodies for Atari and Amstrad (you're going to have to wait for the PCW show to see it running on the Spectrum).

The good news is that these conversions are £6 odd cheaper than on the BBC (courtesy of Superior Software). The bad news is that both are considerably inferior to that excellent program.

Both are slower than the original, and while the Amstrad faithfully recreates the screen display, the Atari fails to do even that. The lack of speed seriously affects the playability and although it's true to say that I've seen worse conversion jobs, whatever made the game a classic on the Commodore and BBC is missing on these two. A severe case of 'play before you purchase'.

## BBC

**Program Who Dares Wins II Type** Arcade **Micro** BBC B **Price** £9.95 disc only **Supplier** Alligata Software, 1 Orange Street, Sheffield S1 4DW.





**Program Urdu Word Processor** Type Utility **Micro** BBC B Price £40.00 + VAT disc, £84.00 + VAT (Rom) **Supplier** Micropraxis Ltd, Enterprise Workshops, Nursery Street, Sheffield S3 8GG.

**Program Cavey Type Arcade** **Micro** BBC/Electron Price £1.99 **Supplier** Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

## CBM 64

**Program Strike Force Harrier** Type Arcade Simulation **Micro** CBM 64 Price £9.95 tape, £12.95 disc. **Supplier** Mirrorsoft, Purnell Book Centre, Paulton, Bristol BS18 5LQ.

**Program Culton 64 Drawing Board** Type Utility **Micro** CBM 64/128 Price £33.35 disc, £56.35 disc + cartridge **Supplier** Culton Sales, 34 Mount Street, Dorking, Surrey.

**Program Mission AD Type** Arcade **Micro** CBM 64 Price £9.95 tape, £14.95 disc **Supplier** Odin Computer Graphics, 74 New Oxford Street, London W1.

**Program ICUPR Type** Arcade **Micro** CBM 64 Price £x.xx tape, £13.95 disc **Supplier** Odin Computer Graphics, 74 New Oxford Street, London W1.

**Program The Boggit Type** Adventure **Micro** CBM 64 Price £7.95 **Supplier** CRL, 9 Kings Yards, Carpenter's Road, London E15 2HD.

**Program Clean-up Time** Type arcade **Micro** CBM 64 Price £1.99 **Supplier** Players Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

**Program Velocipede II Type** Arcade **Micro** CBM 64 Price £1.99 **Supplier** Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

**Program Ronald Rubberduck** Type Arcade **Micro** CBM 64 Price £1.99 **Supplier** Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

## C16/Plus/4

**Program Auriga Type** Arcade **Micro** C16/Plus/4 Price £1.99 **Supplier** Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

**Program Leaper Type** Arcade **Micro** C16/Plus/4 Price £2.99 **Supplier** Bug-Byte, Argus Press Software, Victory House, Leicester Place, London WC2H.

**Program Jail Break Type** Arcade **Micro** C16/Plus/4 Price £2.99 **Supplier** Bug-Byte, Victory House, Leicester Place, London WC2.

**Program Speed King Type** Arcade **Micro** C16/Plus/4 Price £2.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2.

## MSX

**Program Steve Davis Snooker** Type Arcade **Micro** MSX Price £8.95 **Supplier** CDS Software, CDS House, Beckett Road, Doncaster, South Yorkshire DN2 4AD.



## Spectrum

**Program ICUPS Type** Arcade **Micro** Spectrum Price £8.95 **Supplier** Odin Computer Graphics, 74 New Oxford Street, London W1.

**Program PSI-Chess Type** Strategy **Micro** Spectrum Price £9.95 **Supplier** The

Edge, 4th Floor, Dudley House, 36-38 Southampton Street, Covent Garden, London WC2E 7HE.

**Program Shewsbury Key** Type Adventure **Micro** Spectrum Price £1.99 **Supplier** Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

**Program Zaccaron Mystery** Type Adventure **Micro** Spectrum Price £1.99 **Supplier** Players, Mercury House, Calleva Park, Aldermaston, Berks RG7 4QW.

**Program Lap of the Gods** Type Arcade Adventure **Micro** Spectrum Price £1.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2.

**Program Knight Games 2** Type Compilation **Micro** Spectrum Price £2.99 **Supplier** Black Knight Computers, 60 Slades Drive, Chislehurst, Kent BR7 6JX.

**Program Zzzz Type** Adventure **Micro** Spectrum Price £1.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2.

**Program Universal Hero** Type Arcade Adventure **Micro** Spectrum Price £1.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2.

**Program Kane Type** Arcade **Micro** Spectrum Price £1.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2.



**Program Octagon Squad** Type Arcade Adventure **Micro**

**Micro Spectrum Price** £1.99 **Supplier** Mastertronic, 8-10 Paul Street, London EC2.

**Program Johnny Reb II** Type Simulation **Micro** Spectrum Price £9.99 **Supplier** Lotherien, Argus Press Software Group, Victory House, Leicester Place, London WC2 7NB.

**Program Mission Omega** Type Strategy **Micro** Spectrum Price £9.95 **Supplier** Mind Games, Argus Press, Software Group, Victory House, Leicester Place, London WC2H 7NB.



**Program Strike Force Harrier** Type Arcade Simulation **Micro** Spectrum Price £9.95 tape **Supplier** Mirrorsoft, Purnell Book Centre, Paulton, Bristol BS18 5LQ.

I recently came back to this title on another machine, (it originally came out on the BBC quite a way back) and was pleased to find that it stood the test of time remarkably well.

What's more, it stands the test of a good 'simulation' well, too, in that if you don't pay attention, you crash a lot.

All the arcade and strategic elements are still there, and the action is fast and furious as ever. If you're looking for a vertical lift from your Spectrum; this is as good as you'll get.

## Spectrum 128

**Program Ghostbusters Type** Arcade **Micro** Spectrum 128 Price £9.99 **Supplier** Activision, 23 Pond Street, London NW3.

# How are the mighty fallen **NEXT WEEK**

The text for today's sermon is: "How are the mighty fallen". Although in this instance there ought to be a question mark on the end there.

Specifically, how did Commodore, once the world's number one mover of microcomputers, come to be the shambling relic we know today?

It takes more than bad luck to achieve what Commodore has achieved in the past 18 months. It takes a kind of awe-inspiring capacity for self-destruction.

But first, let's establish some credentials. I'm a Commodore fan. I have been since I willingly forked out nearly £300 for a Vic 20 and cassette player these many years ago (the cassette player, incidentally didn't work.)

I was still a fan when I brought a smile to the face of my local dealer, and a conary to my bank manager, when I lashed out another £500 on a Commodore 64 and disc drive.

So (cue violins) it is more in sadness than in anger that I admit that, were I looking for another machine, I'd be making room on my desk for an Atari ST, not an Amiga.

It's not difficult to pinpoint Commodore's mistake. It went wrong when it launched the C16 and Plus/4. The last thing Commodore needed at that point was a couple of dodos like those two.

The error was compounded by time-wasting excursions

into the IBM-compatible market. Then the company fouled up the C128 launch.

The 128 is a great machine, but you'd barely know it existed. To most people it's just a 64 with extra memory in a pretty, new box. But what's

Commodore has been closing factories and sacking workers for the past year.

Yes, it's been a tough year. Acorn shot itself in the foot and almost bled to death; Sinclair was snatched from the brink by Alan Sugar; and



that extra memory worth when there's next to no software making use of it?

Now we're going to get a revamped 64. It looks a bit like the 128 but without the extra memory, and with the 64's lousy Basic.

What it will have that's worthwhile is Geos. But Geos is a disc-based operating system and the 64c doesn't have a built-in disc. It cries out for a mouse, but there's no mouse support.

How long, Lord, how long?

Now Commodore might argue that the 16, the Plus/4, the PC, and the 128 have been successful in their own terms.

Which is why, no doubt,

sundry others have joined the long list of casualties.

But in the same time Amstrad has made the competition look like a bunch of rank amateurs, Apple has pulled itself out of trouble, and Atari is now a long way from being the malignant cancer that almost destroyed the Warner Bros empire.

If the radical surgery that Commodore has had to endure pulls the company through, no-one will be more delighted than me.

But neither the 64c nor the Amiga—the Concorde of the computer industry—is going to do it.

Peter Worlock

## PCW show preview

Britain's premier exhibition for home computers, the *Personal Computer World Show*, kicks off at Olympia on September 3. If you want to know who, and what, will be there, don't miss our show preview. Includes first pictures of *La-serzone*, from new Gargoylle label FTL.

## Hardware

Commodore 64 owners—fed up with your excruciatingly slow 1541 disc drive? Chris Jenkins looks at DolphinDOS, a circuit board device which claims to speed up operations considerably.

## Software



Another battle of the chess giants—this time The Edge puts up *Psi-Chess* to challenge *Colossus*'s latest conversion to the Spectrum.

## Hackers



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